LevyCountyRAIsPEm Resource

From: Brian Anderson
Sent: Tuesday, February 24, 2009 2:31 PM
To: LevyCountyRAIsPEm Resource
Subject: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 009 RELATED TO SRP SECTION 2.5.4 FOR THE LEVY COUNTY UNITS 1 AND 2 COMBINED LICENSE APPLICATION
Attachments: LNP-RAI-LTR-009.doc

Importance: High

Hearing Identifier: Levy_County_COL_eRAIs
Email Number: 10

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Subject: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 009 RELATED TO SRP SECTION 2.5.4 FOR THE LEVY COUNTY UNITS 1 AND 2 COMBINED LICENSE APPLICATION
Sent Date: 2/24/2009 2:30:43 PM
Received Date: 2/24/2009 2:30:45 PM
From: Brian Anderson

Created By: Brian.Anderson@nrc.gov

Recipients:
"LevyCountyRAIsPEm Resource" <LevyCountyRAIsPEm.Resource@nrc.gov>
Tracking Status: None

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Files	**Size**	**Date & Time**
MESSAGE	3	2/24/2009 2:30:45 PM
LNP-RAI-LTR-009.doc	59898	

Options
Priority: High
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

February 24, 2009

Mr. Garry Miller
General Manager, Nuclear Plant Development
Progress Energy Florida, Inc.
PO Box 1551
411 Fayetteville Street Mall
Raleigh, NC 27602

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 003 RELATED TO SRP SECTION 2.5.4 FOR THE LEVY COUNTY NUCLEAR PLANT, UNITS 1 and 2 COMBINED LICENSE APPLICATION

Dear Mr. Miller:

By letter dated July 28, 2008, as supplemented by a letter dated September 12, 2008, Progress Energy Florida, Inc. 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.

If you have any questions or comments concerning this matter, you may contact me at 301-415-9967.

Sincerely,

/**RA**/

Brian C. Anderson, Lead Project Manager
AP1000 Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-029
52-030

eRAI Tracking No. 1986

Enclosure:
Request for Additional Information

If you have any questions or comments concerning this matter, you may contact me at 301-415-9967.

Sincerely,

/**RA**/

Brian C. Anderson, Lead Project Manager
AP1000 Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-029
52-030

eRAI Tracking No. 1986

Enclosure:
Request for Additional Information

Distribution:

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NRO-002

OFFICE	RGS1/BC	NWE1/PM	OGC	NWE1/L-PM
NAME	CMunson *	BAnderson *	JMartin*	BAnderson*
DATE	01/23/09	01/23/09	01/28/09	02/24/09

*Approval captured electronically in the electronic RAI system.

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Request for Additional Information
Levy County, Units 1 and 2
Progress Energy Florida, Inc.
Docket No. 52-029 and 52-030
SRP Section: 02.05.04 - Stability of Subsurface Materials and Foundations
Application Section: 2.5.4

QUESTIONS for Geosciences and Geotechnical Engineering Branch 1 (RGS1)

02.05.04-4

The P-S suspension logger was relied on for determining the elastic properties of the foundation supporting LNP Units 1 and 2. The discreet shear wave velocities measured by the P-S suspension logger are quite variable, ranging -- by wide margins -- from the average value within the zone of influence. Though the P-S suspension logger measures a much shorter interval than the downhole seismic test, its 1 meter separation between receivers is still greater than the majority of no recovery zones indicated on the core logs (2 feet or less).

Please discuss the distinct possibility that near-horizontally oriented lenses of soft material were either completely missed or averaged with the higher velocities of adjacent rock. In addition, please describe how the variableness of the P-S suspension logger results was taken into account in the analyses, and describe how it was determined that the P-S suspension logger measured the actual seismic velocities of the soil filled no recovery zones, and not an average of hard rock and very soft soil.

02.05.04-5

FSAR Section 2.5.4 states that down-hole geophysics suffered from borehole construction techniques (cased versus uncased), and/or limited capabilities of the geophysical tools. It also states that it was not always possible to correlate geophysical data to the physical data measured in the core logs. It is also noted that recovery was generally poor in certain layers, particularly below the proposed grouting zone. Because of poor recovery, the characterization of the soft zones was based on the expertise of the driller and the time it took to sample a 5 ft. core. However, the time of drilling is also a function of the downward pressure exerted on the drill rods.

Please provide information on the magnitude and location of the recorded pressures used during drilling to support the time of drilling and conclusions regarding the materials filling the karst features. If these do not exist, please indicate what other information exists (other than shear and compression wave velocities) to confirm the nature of the materials that were not recoverable.

02.05.04-6

The FSAR and supplements state that the lateral extent of karst features were determined based on grout takes, where that information was available. Grout takes, however, may not help identify soft, soil-filled karst features as the existence of soil will limit the grout take. The result is an underestimation of the volume of the soft zone.

Since boring spacing was 100 feet on average, and down-hole geophysical investigations (natural gamma, neutron, gamma-gamma, P-S suspension logging) have lateral extent limitations, please describe how you confirmed that large soft zones do not exist well beyond the lateral dimension estimated from grout take.

02.05.04-7

The Mohr-Coulomb strength parameters for the rock mass were based on Hoek-Brown methodology and incorporate among other factors, the intact rock compressive strength and a factor, GSI, to account for geologic features within the mass rock. FSAR Section 2.5.4 shows that great variability exists in the measured uniaxial compressive strength on intact samples (one standard deviation being as great as the average compressive strength in most cases), and the availability of intact rock samples was limited because of low recovery.

Please describe how you determined the GSI factor. Include a discussion on how the joint sets and bedding planes and low or no recovery zones were factored into the derivation of the GSI. Please describe any sensitivity analyses you may have performed to determine the influence of lower bound assumptions of the compressive strength and stiffness of intact rock and lower bound GSI factors on stability (bearing capacity and settlement) and stress calculations in the foundation rock.

02.05.04-8

The description of the finite element analysis presented does not clearly indicate if or how soil filled joints and soft bedding layers were incorporated into the evaluation.

Please describe how joint patterns and soil filled bedding planes were modeled in the finite element analysis for evaluation of settlement and bearing capacity.

02.05.04-9

FSAR Section 2.5.4.10 states that average stiffness of the various layers under LNP1 and LNP2 were used to perform bearing capacity and settlement analyses. Average stiffness assumes uniformity in the layers, which the application states is supported by the average shear wave velocity results. However, when considering the distribution of low recovery rates, there appears to be higher recurrence of lower recovery at the center borings, AD-01 and AD-03, at LNP2 and LNP1, respectively.

Please describe what considerations were given to spatial variation of low recovery rates.