PMLevyCOLPEm Resource

From: Anderson, Brian
Sent: Tuesday, October 27, 2009 3:20 PM
To: robert.kitchen@pgnmail.com; david.waters@pgnmail.com; tillie.wilkins@pgnmail.com
Cc: PMLevyCOLPEm Resource
Subject: DRAFT RAIs - SRP sections 2.5.1, 2.5.4 - Levy County Units 1 and 2 Combined License Application
Attachments: LNP Draft RAI 3814 - 2.5.4.doc; LNP Draft RAI 3818 - 2.5.1.doc; LNP Draft RAI 3821 - 2.5.4.doc

Importance: High

Attached are three draft RAIs related to SRP sections 2.5.1 and 2.5.4 for the Levy County Units 1 and 2 Combined License Application. Please let me know if you would like to schedule a conference call to discuss these RAIs.

Thank you,
Brian

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Request for Additional Information No. 3814
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-***

The results of liquefaction evaluations for the existing overburden configuration have been performed using time-dependent estimates of soil demand/capacity ratio that may be developed from the site-specific PSHA. These results indicate that safety factors are generally greater than 1.4, except for several areas away from the NI. However, compacted backfill will be placed on top of the existing site profiles to bring the site to plant grade. The effect of this added overburden will be to increase the effective confining pressures of the soils below (increasing soil capacity) while at the same time increasing induced shears (increasing seismic demands). However, these effects are not affected equally.

Please provide similar liquefaction evaluations for the modified soil columns including the planned surface backfill.

DRAFT

Request for Additional Information No. 3818
Levy County, Units 1 and 2
Progress Energy Florida, Inc.
Docket No. 52-029 and 52-030
SRP Section: 02.05.01 - Basic Geologic and Seismic Information
Application Section: 2.5.1

QUESTIONS for Geosciences and Geotechnical Engineering Branch 1 (RGS1)

02.05.01-***

The response to RAI 2.5.1-12 discusses information related to whether large dissolution voids occur in the subsurface. The response states that the diameter of shallow dissolution features observed at the surface is not indicative of the size of subsurface karst cavities and cites a reference (Sinclair and Stewart, 1985) to support this conclusion. However, a summary of the basis for this conclusion as derived from the cited reference is not provided in the response.

In order for the staff to assess the basis for the statement that the diameter of shallow dissolution features observed at the surface is not indicative of the size of subsurface karst cavities, please summarize the logic for this conclusion as derived from Sinclair and Stewart (1985).

02.05.01-***

The response to RAI 2.5.1-31 discusses available information related to whether underground conduits capable of accommodating rapid groundwater flow occur at or near the Levy site, and provides a figure modified from Maddox (1993) which clearly indicates there are no caves reported near the site. The response states that no caves exist which could act as conduits capable of accommodating rapid groundwater flow within the Avon Park Formation in the outcrop area of Levy County and Citrus County. The response also states that Dr. S. Upchurch concluded there are no springs of any noticeable magnitude with the LNP site vicinity, but no reference is cited to document his conclusion.

In order for the staff to assess the basis for the conclusion drawn by Upchurch which is stated in the response to RAI 2.5.1-31 regarding the point that no springs of any noticeable magnitude occur with the LNP site vicinity, please cite an appropriate reference documenting his conclusion that no springs exist.

02.05.01-***

The response to RAI 2.5.1-35 presents information used by Rupert (1988) to formulate his lithologic descriptions and estimates of unit thicknesses. The response provides lithologic and drillers logs and resistivity and velocity borehole logs from wells which Rupert (1988) examined, and states that neither lithologic or drillers logs recorded voids in the upper 305 m (1000 ft) of the boreholes. However, examination of these logs reveals zones of “no returns” in some holes (e.g., W-3342 at 130-283 ft, 380-648 ft, and 775-907 ft). It is not clear whether these “no-return” zones may represent actual voids rather than washouts of soft carbonate units, since the criteria applied to draw the conclusion that no voids are recorded in the upper 305 m (1000 ft) of the logs are not stated.

In addition, the response to RAI 2.5.1-44 discusses how the presence of deep voids was investigated and states that low-recovery zones reported in the boreholes generally reflected soft carbonate layers

interbedded with more competent units in the Avon Park Formation, rather than significant voids or filled voids. The response also indicates that quick drilling, loss of drilling fluid, minimal to no recovery, and rod drop events as recorded in FSAR Tables 2.5.4.2-205A and 2.5.4.2-205B are common due to the presence of poorly-indurated, soft carbonate beds in the materials being drilled which wash out during drilling, resulting in misinterpretation of such descriptions in the drilling logs as voids or filled voids. It is not clear how materials encountered in boreholes could be precisely classified as soft carbonate layers when there is no recovery based on information shown in Tables 2.5.4.2-205A and 2.5.4.2-205B.

In order for the staff to understand characteristics and properties of subsurface zones described in the drilling logs as exhibiting “no recovery” and “no returns”, please discuss the criteria applied to determine that washout of soft carbonate layers produced these zones rather than dissolution voids or filled voids.

02.05.01-***

The response to RAI 2.5.1-38 discusses information used to conclude that no faults occur within the site vicinity and cites map sources from 1978, 1979, 1992, 2001, and 2008, none of which indicate that faults exist in the site vicinity. The response states that structure contour maps drawn by Arthur and others (2008) on the tops of the Oligocene Suwannee Limestone, the Upper Eocene Ocala Limestone, and the Middle Eocene Avon Park, presented in the response to this RAI, show that no faults affect the Ocala and Avon Park horizons. However, the response does indicate that Arthur and others (2008) postulated two potential faults to account for abrupt thickness changes in the Suwannee Limestone as located on their structural contour map drawn on the top of the Suwannee. It is not clear why abrupt thickness changes in the Oligocene Suwannee Limestone are postulated as being due to potential faults when older rock layers underlying that unit (i.e., the Upper Eocene Ocala Limestone and Middle Eocene Avon Park Formation) are reported to show no faulting based on similar maps.

In order for the staff to understand why proposed faults which cut younger (i.e., overlying) Suwannee Limestone do not affect the older underlying Ocala Limestone and Avon Park Formation, please explain the basis for the interpretation that faults occur in the Suwannee Limestone but not in the older units that underlie the Suwannee.

02.05.01-***

The response to RAI 2.5.1-38, seemingly in response to the part of this RAI asking for the criteria used to distinguish faults in the site vicinity, cites Hanson and others (1999) and lists criteria used to recognize individual paleoseismic events. It is not clear whether these criteria, some of which may not be applicable to specifically distinguishing faults since paleoseismic features do not always delineate specific structures, were applied to delineate faults in the site vicinity as initially asked in RAI 2.5.1-38.

In order for the staff to understand the criteria applied to distinguish faults in the site vicinity, please clarify which of those listed for recognizing individual paleoseismic events were used to distinguish faults in the site vicinity.

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Request for Additional Information No. 3821
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-***

In your response to RAI 2.5.4-19 you cited two analyses to show that sliding stability of the nuclear island did not depend on the backfill. The non-linear analysis referenced in the response is still under review, and RAI response RAI-TR85-SEB1-10R2 has not been accepted. In response to RAI 2.5.4-22, you did not address dissolution or leaching of constituent components of the CLSM because you stated that there was no backfill strength requirement.

Please provide a sample calculation of the linear static analysis you performed, with a detailed explanation of the derivation of the horizontal loads employed.

DRAFT