PMLevyCOLPEm Resource

From: Brian Anderson
Sent: Tuesday, May 05, 2009 5:10 PM
To: robert.kitchen@pgnmail.com; david.waters@pgnmail.com; tillie.wilkins@pgnmail.com; PMLevyCOLPEm Resource
Subject: DRAFT RAIs - 2162, 2164, 2183 - SRP sections 2.4.6, 2.4.12, 2.4.13 - Levy County Units 1 and 2 Combined License Application
Attachments: LNP Draft RAI 2162 - 2.4.6.doc; LNP Draft RAI 2164 - 2.4.12.doc; LNP Draft RAI 2183 - 2.4.13.doc

Importance: High

Attached are three draft RAIs related to SRP sections 2.4.6, 2.4.12, and 2.4.13 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

Brian Anderson
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Subject: DRAFT RAIs - 2162, 2164, 2183 - SRP sections 2.4.6, 2.4.12, 2.4.13 - Levy County Units 1 and 2 Combined License Application
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MESSAGE	422	5/5/2009 5:09:36 PM
LNP Draft RAI 2162 - 2.4.6.doc	40954	
LNP Draft RAI 2164 - 2.4.12.doc	42490	
LNP Draft RAI 2183 - 2.4.13.doc	33274	

Options
Priority: High
Return Notification: No
Reply Requested: No
Sensitivity: Normal
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Request for Additional Information No. 2162
Levy County, Units 1 and 2
Progress Energy Florida, Inc.
Docket No. 52-029 and 52-030
SRP Section: 02.04.06 - Probable Maximum Tsunami Flooding
Application Section: FSAR Section 2.4

QUESTIONS for Hydrologic Engineering Branch (RHEB)

02.04.06-***

To meet the requirements of GDC 2, 10 CFR 52.17, and 10 CFR Part 100, the applicant should provide an assessment of the Probable Maximum Tsunami (PMT) for the proposed site. Section C.I.2.4.6.1 of Regulatory Guide 1.206 (RG 1.206) provides specific guidance with respect to determination of the PMT. This includes a discussion of the most reasonably severe geo-seismic activity possible and corresponding tsunami analysis. Please provide a discussion in the updated FSAR of the PMT assessment for the Levy County site, including the controlling source for the PMT and corresponding tsunami water level determination, or explain why such a discussion is not necessary.

02.04.06-***

To meet the requirements of GDC 2, 10 CFR 52.17, and 10 CFR Part 100, the applicant should provide an assessment of the Probable Maximum Tsunami (PMT) for the proposed site. Section C.I.2.4.6.1 of Regulatory Guide 1.206 (RG 1.206) provides specific guidance with respect to determination of the PMT. This includes a discussion of the generation of tsunami-like waves from hill-slope failures and the stability of the coastal area. Please discuss the hill-slope failures near the Levy County site with reference to the findings in Section 2.5 of the FSAR, or explain why such a discussion is not necessary.

02.04.06-***

To meet the requirements of GDC 2, 10 CFR 52.17, and 10 CFR Part 100, the applicant should provide an assessment of the Probable Maximum Tsunami (PMT) for the proposed site. Section C.I.2.4.6.2 of Regulatory Guide 1.206 (RG 1.206) provides specific guidance with respect to the historical tsunami record, including paleo-tsunami evidence. Please provide a clarification of the meaning of the descriptor “impact” as used on pg. 2.4-45 of the FSAR: “…historically no Caribbean tsunami has *impacted* the United States Gulf Coast.”

02.04.06-***

To meet the requirements of GDC 2, 10 CFR 52.17, and 10 CFR Part 100, the applicant should provide an assessment of the Probable Maximum Tsunami (PMT) for the proposed site. Section C.I.2.4.6.2 of Regulatory Guide 1.206 (RG 1.206) provides specific guidance with respect to the historical tsunami record, including paleo-tsunami

evidence. In the updated FSAR, please provide a clarification as to whether any of the Maximum Water Height measurements listed in Table 2.4.6-202 are located in the Gulf of Mexico, or explain why such a discussion is not necessary.

02.04.06-***

To meet the requirements of GDC 2, 10 CFR 52.17, and 10 CFR Part 100, the applicant should provide an assessment of the Probable Maximum Tsunami (PMT) for the proposed site. Section C.I.2.4.6.2 of Regulatory Guide 1.206 (RG 1.206) provides specific guidance with respect to the historical tsunami record, including paleo-tsunami evidence. Please provide a clarification on whether there is any geologic evidence of tsunami deposits at the Levy County site or at nearby regions. Additionally, indicate whether there are geologically conducive locations for the deposition and preservation of tsunami deposits in the vicinity of the Levy County site. If such paleo-tsunami evidence exists, please indicate how they are distinguished from storm wash-over deposits.

02.04.06-***

To meet the requirements of GDC 2, 10 CFR 52.17, and 10 CFR Part 100, the applicant should provide an assessment of the Probable Maximum Tsunami (PMT) for the proposed site. Section C.I.2.4.6.3 of Regulatory Guide 1.206 (RG 1.206) provides specific guidance with respect to the source characteristics needed to determine the PMT. These characteristics include detailed geo-seismic descriptions of the controlling local tsunami generators, including location, source dimensions, and maximum displacement. Provide a discussion in the updated FSAR of submarine landslides in the Gulf of Mexico, other than East Breaks, as potential tsunami generators, including the Mississippi Canyon landslide, and landslides along the Florida Escarpment and along the slope above the Florida Escarpment, or discuss why this information is not needed in the FASR. In the updated FSAR, please clarify whether the East Breaks landslide is considered as the PMT source, in relation to discussion of the north Venezuela seismogenic tsunami as having “the most severe impacts for the Gulf Coast” (pg. 2.4-58), or explain why such a discussion is not necessary.

02.04.06-***

To meet the requirements of GDC 2, 10 CFR 52.17, and 10 CFR Part 100, the applicant should provide an assessment of the Probable Maximum Tsunami (PMT) for the proposed site. Section C.I.2.4.6.3 of Regulatory Guide 1.206 (RG 1.206) provides specific guidance with respect to the source characteristics needed to determine the PMT. These characteristics include detailed geo-seismic descriptions of the controlling distant tsunami generators, including location, source dimensions, fault orientation, and maximum displacement. In the updated FSAR, please provide clarification regarding seismologic characterization of the region offshore of Veracruz, Mexico, relative to the generation of tsunamis, or explain why such a discussion is not necessary.

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02.04.06-***

To meet the requirements of GDC 2, 10 CFR 52.17, and 10 CFR Part 100, the applicant should provide an assessment of the Probable Maximum Tsunami (PMT) for the proposed site. Section C.I.2.4.6.4 of Regulatory Guide 1.206 (RG 1.206) provides specific guidance with respect to tsunami analysis. This includes providing a complete description of the analysis procedure used to calculate tsunami wave height and period at the site, including the theoretical bases of the models, their verification and the conservatism of all input parameters. Please provide theoretical basis, assumptions (e.g., source parameterization), and applicability to the Levy County site for the tsunami attenuation function discussed on pg. 2.4-53 (Equation 2.4.6-1) and make available the details of the Monte Carlo analysis used to estimate the maximum wave height and where the maximum wave height estimate is geographically located. For this and other methods of tsunami analysis indicated in the FSAR, please provide the procedure used to calculate tsunami propagation, runup, and inundation (i.e., tsunami water levels) at the Levy County site from offshore tsunami amplitude.

02.04.06-***

To meet the requirements of GDC 2, 10 CFR 52.17, and 10 CFR Part 100, the applicant should provide an assessment of the Probable Maximum Tsunami (PMT) for the proposed site. Section C.I.2.4.6.4 of Regulatory Guide 1.206 (RG 1.206) provides specific guidance with respect to tsunami analysis. This includes providing a complete description of the analysis procedure used to calculate tsunami wave height and period at the site. In the updated FSAR, please resolve the apparent inconsistency of the statement that the Gulf of Mexico contains no sources of reverse faults (1st sentence, section 2.4.6.4.1.2, pg. 2.4-52) given the mechanism of the September 10, 2006 Mw=5.8 in the NE Gulf of Mexico (third sentence), or explain why such a discussion is not necessary.

02.04.06-***

To meet the requirements of GDC 2, 10 CFR 52.17, and 10 CFR Part 100, the applicant should provide an assessment of the Probable Maximum Tsunami (PMT) for the proposed site. Section C.I.2.4.6.5 of Regulatory Guide 1.206 (RG 1.206) provides specific guidance with respect to tsunami water levels. This includes describing the ambient water levels, including tides, sea level anomalies, and wind waves assumed to be coincident with the tsunami. Please clarify the use of the value for 10% exceedance high-tide and long-term sea-level rise coincident with maximum tsunami water levels at the Levy County site.

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Request for Additional Information No. 2164
Levy County, Units 1 and 2
Progress Energy Florida, Inc.
Docket No. 52-029 and 52-030
SRP Section: 02.04.12 - Groundwater
Application Section: FSAR Section 2.4

QUESTIONS for Hydrologic Engineering Branch (RHEB)

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please include details of groundwater chemistry as it relates to transport properties of the subsurface.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please provide details of plant water supply wells including the design of the wellfield and the projected impacts of pumping on transport pathways, surrounding surface waters, and adjacent offsite groundwater users.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please provide detailed explanation for the difference in well densities shown in FSAR Figures 2.4.12-206 to 2.4.12-210.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5,10 CFR 100.20(c)(3), 10 CFR 100.23(d), and 10 CFR 100.10(c) or 100.20(c), a complete description of the effects of groundwater levels and other hydrodynamic effects on the design bases of plant foundations and other SSC important to safety is needed. Please discuss LNP groundwater usage from the Upper Floridan Aquifer in relation to a basin or subbasin scale water balance and the projected impacts of pumping on groundwater elevations at the nuclear islands.

02.04.12-***

Please correct the typographical error in the third sentence of the last paragraph on FSAR Revision 0, page 2.4-72

02.04.12-***

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To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please provide, in spreadsheet or similar format, the site groundwater elevation monitoring data (including the monitoring locations) and the available historical seasonal groundwater elevations in the vicinity of the LNP site.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please clarify the description of groundwater discharge areas in the FSAR.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and 10 CFR 100.10(c) or 100.20(c), please clarify the significance of vertical hydraulic gradients in relation to the selection of the most conservative plausible conceptual model for transport of radioactive liquid effluents in the subsurface.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please clarify the interpretation of vertical groundwater gradients, with particular reference to (1) FSAR Revision 0, page 2.4-73, which states that the LNP site is “in a transitional area between upward and downward vertical gradients” on account of the low magnitudes of the vertical gradients, and (2) FSAR Revision 0, Table 2.4.12-209, in which the groundwater gradients are without exception downward.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please clarify whether any spatial trend or regularities are evident in the hydraulic conductivities measured by the slug tests on the LNP site.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please clarify the apparent discrepancy in the estimated transmissivity range presented in FSAR Revision 0 Section 2.4.12.1.1 and the average transmissivity values derived from slug tests. Please discuss which of these values are most representative of actual site conditions.

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02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please justify the approach adopted for analysis of pumping tests in the FSAR.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please discuss selection of the hydraulic conductivity estimates used in the seepage velocity calculations and whether these represent conservative estimates of groundwater velocity.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please provide pertinent references from the calculation titled “Groundwater Velocity and Flux Calculations (LNG-0000-X7C-006, Rev0),” for NRC review.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please justify the use of the porous media concept for estimating seepage velocity and whether preferential flow paths associated with fracturing and solution cavities in carbonate rock aquifers at the LNP site should be considered when developing conservative estimates of groundwater velocity.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please clarify the potential effects of groundwater pumping for plant water supply on groundwater levels, transport pathways, surface water, and other water users in the affected area.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please provide a description of plausible groundwater pathways for use in the analysis of transport of accidental liquid radioactive effluent release in the subsurface.

02.04.12-***

DRAFT

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please update FSAR Section 2.4.12.4 with a summary of the details of groundwater monitoring under the Radiation Protection Program included in FSAR Section 12AA.5.4.14, or describe why it is not necessary to update the FASR with this information.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please provide a description of post-construction groundwater conditions near the safety-related SSCs with respect to the DCD maximum allowable groundwater elevation.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and 10 CFR 100.10(c) or 100.20(c), a complete description of the effects of groundwater levels and other hydrodynamic effects on the design bases of plant foundations and other SSC important to safety is needed. Please describe the process followed to determine that the conceptual models of subsurface site characteristics related to groundwater that were evaluated to ensure that the most conservative of plausible conceptual models has been identified.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and 10 CFR 100.10(c) or 100.20(c), a complete description of the site dewatering system, including its reliability to maintain the groundwater conditions within the groundwater design bases of SSC important to safety is needed. Please describe the conceptual design of the system for dewatering plant foundation excavations during dewatering. This description should include approximate locations, numbers, and estimated pumping rates of wells or other dewatering facilities; total rate and duration of dewatering; how pumped water will be handled; and effects of dewatering on affected groundwater and surface water resources.

02.04.12-***

To meet the requirements of 10 CFR 50.55a, GDC 2, GDC 4, GDC 5, 10 CFR 100.20(c)(3), 10 CFR 100.23(d), and10 CFR 100.10(c) or 100.20(c), please make available to the NRC staff all boring logs associated with monitoring wells, observation wells, and the pumping well listed in Table 2.4.12-207.

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Request for Additional Information No. 2183
Levy County, Units 1 and 2
Progress Energy Florida, Inc.
Docket No. 52-029 and 52-030
SRP Section: 02.04.13 - Accidental Releases of Radioactive Liquid Effluents in Ground and Surface Waters
Application Section: FSAR Section 2.4

QUESTIONS for Hydrologic Engineering Branch (RHEB)

02.04.13-***

To meet the requirements of GDC 2, 10 CFR 52.17 and 10 CFR Part 100, please describe the process followed to determine the conceptual models for surface and subsurface pathways, and to establish the site characteristics that affect transport of radioactive liquid effluents in ground and surface waters that were evaluated, and to ensure that the most conservative of plausible conceptual models has been identified.

02.04.13-***

To meet the requirements of GDC 2, 10 CFR 52.17 and 10 CFR Part 100, please clarify the total thickness of the Floridan aquifer, in particular the Upper Floridan aquifer, at the LNP site. The thickness of the Floridan aquifer above the Middle Confining Unit (MCU) should be clarified, since the MCU appears to represent a practical lower boundary for the portion of the flow system likely to be actively involved in transport of releases.

02.04.13-***

To meet the requirements of GDC 2, 10 CFR 52.17 and 10 CFR Part 100, please discuss LNP groundwater usage from the Upper Floridan aquifer in relation to the projected impacts of pumping on subsurface radionuclide transport pathways at the LNP site.

02.04.13-***

To meet the requirements of GDC 2, 10 CFR 52.17 and 10 CFR Part 100, please justify why assuming a release at the top of the Floridan aquifer is conservative (FSAR Revision 0, page 2.4-79, 5th paragraph). In particular, please discuss whether a release to the surficial aquifer could result in a pathway to surface water, including marshes or ditches at the LNP site that are closer than the nearest offsite well.

02.04.13-***

To meet the requirements of GDC 2, 10 CFR 52.17 and 10 CFR Part 100, please clarify why use of the one-dimensional advection-dispersion equation for solute transport in porous media is appropriate at the LNP site.

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02.04.13-***

To meet the requirements of GDC 2, 10 CFR 52.17 and 10 CFR Part 100, please describe the computer software used to implement the mathematical model described in FSAR 2.4.13.2.1. Please describe the verification and validation procedures used to verify the accuracy of the model, as implemented in the software.

02.04.13-***

To meet the requirements of GDC 2, 10 CFR 52.17 and 10 CFR Part 100, please list the sources of the model parameters listed in FSAR Revision 0 Table 2.4.13-203.

02.04.13-***

To meet the requirements of GDC 2, 10 CFR 52.17 and 10 CFR Part 100, please provide the tritium concentration as a function of time in the FSAR, or justify why this information is not necessary.

02.04.13-***

Please provide site-specific measurements of K_d as required by 10 CFR 100.20(c)(3).

02.04.13-***

To meet the requirements of GDC 2, 10 CFR 52.17 and 10 CFR Part 100, please discuss the potential impacts of chelating agents on K_d values and on radionuclide transport in the FSAR.

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