



Serial: NPD-NRC-2011-068
September 14, 2011

10CFR52.79

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

**LEVY NUCLEAR PLANT, UNITS 1 AND 2
DOCKET NOS. 52-029 AND 52-030
SUPPLEMENT 5 TO RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER
NO. 086 RELATED TO FOUNDATIONS**

- References:
1. Letter from Terri Spicher (NRC) to Garry Miller (PEF), dated March 16, 2010, "Request for Additional Information Letter No. 086 Related to SRP Section 3.8.5 for the Levy County Nuclear Plant, Units 1 and 2 Combined License Application"
 2. Letter from John Elnitsky (PEF) to U. S. Nuclear Regulatory Commission (NRC), dated August 18, 2010, "Response to Request for Additional Information Letter No. 086 Related to Foundations," Serial: NPD-NRC-2010-068
 3. Letter from John Elnitsky (PEF) to U.S. NRC, dated November 2, 2010, "Supplement 1 to Response to Request for Additional Information Letter No. 086 Related to Foundations", Serial: NPD-NRC-2010-080
 4. Letter from John Elnitsky (PEF) to U.S. NRC, dated January 25, 2011, "Supplement 2 to Response to Request for Additional Information Letter No. 086 Related to Foundations", Serial: NPD-NRC-2011-001
 5. Letter from John Elnitsky (PEF) to U.S. NRC, dated May 12, 2011, "Supplement 3 to Response to Request for Additional Information Letter No. 086 Related to Foundations", Serial: NPD-NRC-2011-042
 6. Letter from John Elnitsky (PEF) to U.S. NRC, dated May 27, 2011, "Supplement 4 to Response to Request for Additional Information Letter No. 086 Related to Foundations", Serial: NPD-NRC-2011-044

Ladies and Gentlemen:

Progress Energy Florida, Inc. (PEF) hereby submits a supplemental response to the Nuclear Regulatory Commission's (NRC) request for additional information provided in Reference 1.

A supplemental response to one of the NRC questions (RAI #03.08.05-07) is addressed in the enclosure. The enclosure also identifies a change that will be made in a future revision of the Levy Nuclear Plant Units 1 and 2 application.

Progress Energy Florida, Inc.
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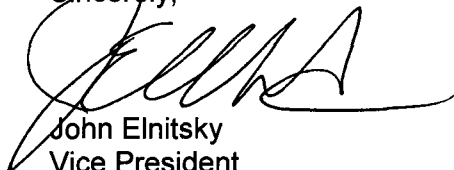
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NRO

If you have any further questions, or need additional information, please contact Bob Kitchen at (919) 546-6992, or me at (727) 820-4481.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 14, 2011.

Sincerely,

A handwritten signature in black ink, appearing to read 'John Elnitsky', written over the word 'Sincerely,'.

John Elnitsky
Vice President
New Generation Programs & Projects

Enclosure/Attachment

cc : U.S. NRC Region II, Regional Administrator
Mr. Brian C. Anderson, U.S. NRC Project Manager

**Levy Nuclear Plant Units 1 and 2
Supplement 5 to Response to NRC Request for Additional Information Letter No. 086
Related to SRP Section 03.08.05 for the Combined License Application,
Dated March 16, 2010**

<u>NRC RAI #</u>	<u>Progress Energy RAI #</u>	<u>Progress Energy Response</u>
03.08.05-4	L-0860, L-0861 & L-0862	NPD-NRC-2010-080; November 2, 2010 & NPD-NRC-2011-042; May 12, 2011 & NPD-NRC-2011-044; May 27, 2011
03.08.05-5	L-0729	NPD-NRC-2010-068; August 18, 2010
03.08.05-6	L-0923	NPD-NRC-2011-044; May 27, 2011
03.08.05-7	L-0864 & L-0986	NPD-NRC-2011-001; January 25, 2011 & Supplemental response enclosed – see following pages

NRC Letter No.: LNP-RAI-LTR-086

NRC Letter Date: March 16, 2010

NRC Review of Final Safety Analysis Report

NRC RAI #: 03.08.05-07

Text of NRC RAI:

In the applicant response to Question 3.8.5-03, Part 1, of RAI 2925 (NRC Letter No. 055) the applicant described the approach used to compute seismic displacements at the foundation level for the Annex, Radwaste and the Turbine buildings. Evaluation of the response has lead to three additional questions.

1. It does not appear from the description provided in Part 1(d), that the effects of drilled shaft -to- drilled shaft interaction are considered. Interaction will reduce the stiffness of the foundation, thereby increasing the displacement to be expected. Discussions between the applicant and the NRC staff indicate that the design of these foundations are not complete, however, it has been assumed that the drilled shaft spacing will be sufficient to preclude interaction. Since the spacing and size of the deep foundations have not been developed, the potential effects of interaction cannot be dismissed out-of-hand. Please indicate the procedure(s) that will be used to assess the significance of the interaction effects between the drilled shafts in final design.
2. The description of application of loads to the pile group indicates that displacements were computed for the application of the inertial loading to the top of the piles. An additional source of relative displacement between the adjacent structures and the nuclear island, that appears to be neglected, is any additional displacement that may be developed from the soils along the sides of the RCC mat, including the engineered fill. This displacement will occur between the base of the RCC mat and the top of the soil corresponding to the elevation of the top of the pile foundation. See the attached sketch. Please provide the basis for neglecting this displacement including an estimate of its magnitude.
3. It appears that the ground motion used to assess liquefaction potential and global displacement of structures is the displacements associated with the GMRS and the related PBSRS. Since the performance goal is defined by the UHRS at the return period associated with the performance goal, please clarify why displacement and liquefaction are not evaluated to this higher desired performance level rather than the displacements associated with the GMRS.

PGN RAI ID #: L-0986

PGN Response to NRC RAI:

Subsequent to submittal of NRC Letter 086 RAI 03.08.05-07 revised response via Progress Energy Letter NPD-NRC-2011-001 dated January 25, 2011 (PGN RAI ID #: L-0864), calculation LNG-0000-XCC-002 entitled "SSE Induced Displacements at the Foundations of Turbine / Radwaste and Annex Bldgs" has been revised to address the revised Radwaste Building (RB) foundation loadings. The revisions to the previously submitted response are as follows:

1. Figure RAI 03.08.05-07-1 has been revised to show the new layout for the RB drilled shaft foundation. The 3 ft. diameter drilled shafts under the RB have been revised to 4 ft. diameter drilled shafts.
2. The revised group efficiency factors, maximum drilled shaft to drilled shaft interaction factor, and probable maximum relative displacements for the RB based on the revised calculation are:
 - a. Paragraph 1c of response PGN RAI ID #: L-0864
The revised group efficiency factors for the RB vary from 0.583 @ 6.0 Hz to 0.826 @15 Hz.
 - b. Paragraph 1d of response PGN RAI ID #: L-0864
The revised maximum drilled shaft to drilled shaft interaction factor for RB is 1.72.
 - c. Paragraph 4f of response PGN RAI ID #: L-0864
The revised probable maximum relative displacement between the Nuclear Island (NI) and the RB for the Performance Based Surface Response Spectra (PBSRS) is 0.25 in. and 0.77 in. for the Best Estimate and the Lower Bound soil profiles respectively.
 - d. Paragraph 5b of response PGN RAI ID #: L-0864
The revised probable maximum relative displacement between the NI and the RB for the 10^{-5} UHRS is 0.45 in.

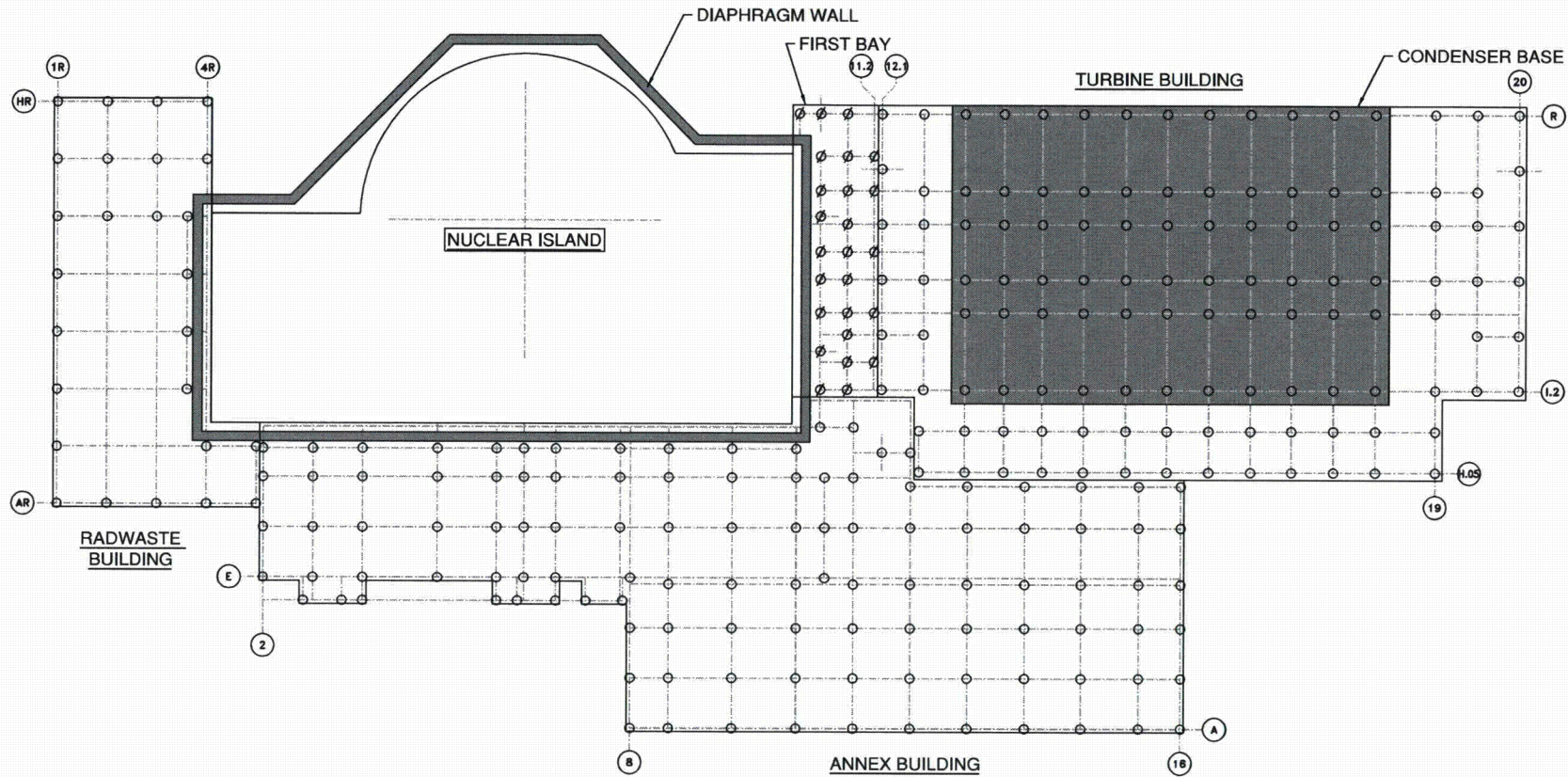
Associated LNP COL Application Revisions:

The following change will be made to the LNP FSAR in a future revision:

Revised Figure RAI 03.08.05-07-1, as shown in the attachment, will be added to the FSAR (referenced in FSAR Subsection 3.8.5.9).

Attachment:

Revised Figure RAI 03.08.05-07-1



LEGEND:
 ○ 4-FOOT DIAMETER DRILLED SHAFT
 ∅ 6-FOOT DIAMETER DRILLED SHAFT

DRILLED SHAFT QUANTITIES		
BUILDING	NUMBER	
	4' ∅	6' ∅
TURBINE CONDENSER BASE	66	0
TURBINE FIRST BAY	0	25
TURBINE (EXCLUDING CONDENSER BASE & FIRST BAY)	56	0
RADWASTE	26	0
ANNEX	113	0



Progress Energy Florida
 Levy Nuclear Plant
 Units 1 and 2
 Part 2, Final Safety Analysis Report
 DRILLED SHAFT LAYOUT FOR TURBINE,
 ANNEX, AND RADWASTE BUILDINGS
 FIGURE RAI 03.08.05-07-1 Rev 2