



L-2011-500
10 CFR 52.3

November 16, 2011

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

Re: Florida Power & Light Company
Proposed Turkey Point Units 6 and 7
Docket Nos. 52-040 and 52-041
Response and Response Schedule to NRC Request for Additional
Information Letter No. 040 (eRAI 6006) SRP Section - 02.05.04
Stability of Subsurface Materials and Foundations

Reference:

1. NRC Letter to FPL dated October 18, 2011, Request for Additional Information Letter No.040 Related to SRP Section 02.05.04 - Stability of Subsurface Materials and Foundations for the Turkey Point Nuclear Plant Units 6 and 7 Combined License Application

Florida Power & Light Company (FPL) provides, as attachments to this letter, its responses to the Nuclear Regulatory Commission's (NRC) Request for Additional Information (RAI) 02.05.04 -3, RAI 02.05.04 -4, and RAI 02.05.04 -21 provided in Reference 1. The attachment identifies changes that will be made in a future revision of the Turkey Point Units 6 and 7 Combined License Application (if applicable).

Additionally, the Nuclear Regulatory Commission (NRC) requested Florida Power & Light Company (FPL) to respond to the Request for Additional Information (RAI) within 30 days of the date of the referenced letter. If FPL was unable to provide a response within 30 days, NRC requested FPL to provide a schedule to provide the responses. This letter also provides the FPL schedule to respond to the NRC Requests for Additional Information (RAI) 02.05.04-1, 02.05.04-2, 02.05.04-5 through 02.05.04-20, 02.05.04-22, 02.05.04-23, and 02.05.04-24 provided in the referenced letter.

The responses to RAI 02.05.04-2, RAI 02.05.04-5, RAI 02.05.04-6 RAI 02.05.04-7, RAI 02.05.04-8, RAI 02.05.04-11, RAI 02.05.04-13, RAI 02.05.04-15, RAI 02.05.04-18, and RAI 02.05.04-24 are scheduled to be provided by December 2, 2011.

The responses to RAI 02.05.04-9, RAI 02.05.04-10, RAI 02.05.04-12, RAI 02.05.04-14, RAI 02.05.04-16, RAI 02.05.04-19, and RAI 02.05.04-22 are scheduled to be provided by December 16, 2011.

Florida Power & Light Company

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The responses to RAI 02.05.04-1, RAI 02.05.04-17, RAI 02.05.04-20, and RAI 02.05.04-23 are scheduled to be provided by January 19, 2012

If you have any questions, or need additional information, please contact me at 561-691-7490.

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

Executed on November 16, 2011

Sincerely,



William Maher
Senior Licensing Director – New Nuclear Projects

WDM/RFB

Attachment 1: FPL Response to NRC RAI No. 02.05.04 - 3 (eRAI 6006)
Attachment 2: FPL Response to NRC RAI No. 02.05.04 - 4 (eRAI 6006)
Attachment 3: FPL Response to NRC RAI No. 02.05.04 - 21 (eRAI 6006)

cc:

PTN 6 & 7 Project Manager, AP1000 Projects Branch 1, USNRC DNRL/NRO
Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant 3 & 4

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NRC RAI Letter No. PTN-RAI-LTR-040

SRP Section: 02.05.04 - Stability of Subsurface Materials and Foundations

QUESTIONS from Geosciences and Geotechnical Engineering Branch 1 (RGS1)

NRC RAI Number: 02.05.04-3 (eRAI 6006)

FSAR Subsection 2.5.4.2.2 indicates that adjustments are made to the subsurface investigation including changes to the field testing locations and to the types. Also, the applicant made adjustments to depths and frequencies of sampling. In accordance with NUREG-0800, Standard Review Plan, Chapter 2.5.4, "Stability of Subsurface Materials and Foundations," and Regulatory Guide (RG) 1.132, "Site Investigations for Foundations of Nuclear Power Plants," please provide further information on how and to what extent these adjustments vary from the recommendations provided in RG 1.132 and justify its acceptance for characterizing site subsurface conditions.

FPL RESPONSE:

Regulatory Guide (RG) 1.132 (Revision 2) provides guidance on conducting subsurface explorations including investigation methods, location and depth of exploration points, and *in situ* tests. Section C.1 of the guide states that the "...site investigation program will be site dependent; such a program should be tailored to the specific conditions of the site using sound professional judgment." The guide also acknowledges that the program should be flexible and adjusted as the investigation proceeds.

As indicated in FSAR Subsection 2.5.4.2.2.1, the guidance in RG 1.132 was used as the basis for planning the site-specific subsurface investigation for Turkey Point Units 6 & 7. Local geologic information from the subsurface investigation for Turkey Point Units 3 & 4 was used in planning the investigation. In the powerblock, the boring layout included a minimum of one boring or CPT per structure and one boring or CPT per 10,000 square feet of structure plan area. Planned drilling methods included mud rotary for geotechnical boreholes. Triple-tube wire-line coring was used to sample rock. Overall, the subsurface investigation program as summarized in FSAR Section 2.5.4.2.2 included 88 geotechnical borings, 22 groundwater observation wells, 4 cone penetrometer tests, and 2 test pits. Surface and downhole geophysical surveys (as described in Subsection 2.5.4.4) were also conducted. These surveys included borehole logging (natural gamma, long and short normal resistivity, spontaneous potential, caliper, and deviation), P-S suspension velocity logging, downhole seismic velocity logging, and an integrated geophysical survey for evaluation of potential dissolution features.

After the start of field work, adjustments to the subsurface investigation program were made to account for site specific conditions, for both accessibility and subsurface issues. These adjustments included exploration methods, borehole locations, sampling frequencies, and exploration depths. Changes to the exploration program were documented with either a revision to the specification or through the submission, by the subcontractor, of a Supplier Deviation Disposition Request (SDDR) form. This form, and its

use, was provided in the subsurface investigation specification. A summary of adjustments reported with the SDDR process is presented in Table 1.

During the initial drilling activities, the Tamiami Formation underlying the Fort Thompson Formation was found to be less dense than anticipated from review of previous subsurface data. For this reason, CPT soundings were added to the exploration program with a revision to the specification. The CPTs were advanced into the Tamiami and Peace River Formations to aid in characterizing these materials. Execution of the CPT program necessitated coring the overlying Key Largo and Fort Thompson at these locations. Additionally, one boring, B-701, was extended into the underlying Arcadia Formation to confirm the characterization of this material.

The depth of exploration and frequency of sampling utilized the guidance in RG 1.132. As stated in FSAR Section 2.5.4.2.2.3, the borings beneath the reactors and key structures extended to 250 feet with one boring beneath each reactor to at least 400 feet. The deepest boring (B-701) was extended to a depth of 615.5 feet.

RG 1.132 Section 4.3.1 states that at least one continuously sampled boring should be used for each safety-related structure. Generally, soil was sampled at 2.5-foot intervals to 15 feet and then 5-foot intervals until rock coring began (when SPT refusal was encountered) or at a depth of about 35 feet. The Key Largo and Fort Thompson Formation limestones were then cored continuously. SPT sampling was conducted at approximately 10-foot intervals in the sands and silts of the underlying Tamiami and Peace River Formations. In the deepest boring, where the Arcadia Formation was encountered, the rock was cored continuously. In summary, the rock formations were sampled continuously. The soil was sampled at close intervals near the surface and then at an increased interval at greater depths, reflecting the lessening variability of soils with increasing depth.

RG 1.132 Section 4.3.1.2 states that boreholes with depths greater than 100 feet should be surveyed for deviation. As stated in FSAR Section 2.5.4.4.3, deviation measurements were conducted in the 10 uncased boreholes in which borehole geophysical logging was performed. The depths of these deviation data in the boreholes ranged from approximately 157 to 610 feet as provided in Table 5 of Appendix D – Geovision Downhole and P-S Logging Report in Volume 2 of FSAR Reference 257.

Adjustments made during field work accounted for differing surface and subsurface conditions. These changes provided enhancements to the original exploration program to supplement characterization of site conditions. Some boring locations were altered due to environmental concerns; however these borings were associated with non safety-related structures. All adjustments made were consistent with RG 1.132 guidance.

Table 1 - Summary of SDDR Issues

SDDR NO. (25409-102-YD4- CY00-XXXXX)	Subject	Cause of Adjustment	Associated with Safety- Related Structures
00007	Drilling fluids permitted while rock coring, except in association with wells	Improve sample recovery and integrity	yes
00008	PS velocity logging modified to eliminate the upper 20 to 30 feet	Soft ground conditions required casing which precluded obtaining P-S logging data	yes
00015	Relocate borings B-613, B-614, and B-615	Minimize environmental impact	no
00017	Relocate borings B-734, B-735, B-736, and B-737 and wells OW-735U, OW-735L	Minimize environmental impact	no
00018	Relocate borings B-806 and B-807, wells OW-636U, OW-636L	Minimize environmental impact	no
00019	Relocate boring B-621, wells OW-621U and OW-621L	Minimize environmental impact	no
00020	Relocate boring B-805, wells OW-805U and OW-805L	Location inaccessible, submerged land	no
00024	Relocate borings B-634, B-635, B-636, and B-637	Minimize environmental impact	no
00025	Delete boring B-801, relocate borings B-812, B-813, and B-814, and wells OW-802U, OW-802L, OW-812U and OW-812L	Deleted boring due to inaccessibility (submerged land), relocated borings to minimize environmental impact	no
00026	Delete borings B-638, B-803 and B-804	Deleted borings due to inaccessibility (submerged land)	no
00027	Relocate boring B-802, wells OW-802U and OW-802L	Minimize environmental impact	no
00028	Install wells OW-802L and OW-805L in geotechnical boreholes instead of separate borings	Soft ground conditions restricted access to original well locations	no
00030	Relocate test pits TP-601 and TP-701	Minimize environmental impact	no
00032	Relocate boring B-813	Minimize environmental impact	no
00033	Change secondary seismic method from crosshole to downhole	More appropriate method for site-specific geology	yes
00039	Install 2 additional wells OW-606D and OW-706D, conduct slug tests	Evaluate hydrogeologic properties of Tamiami Formation	no

This response is PLANT SPECIFIC.

References:

None

Proposed Turkey Point Units 6 and 7
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FPL Response to NRC RAI No. 02.05.04-3 (eRAI 6006)
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ASSOCIATED COLA REVISIONS:

None

ASSOCIATED ENCLOSURES:

None

Proposed Turkey Point Units 6 and 7
Docket Nos. 52-040 and 52-041
FPL Response to NRC RAI No. 02.05.04-4 (eRAI 6006)
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NRC RAI Letter No. PTN-RAI-LTR-040

SRP Section: 02.05.04 - Stability of Subsurface Materials and Foundations

QUESTIONS from Geosciences and Geotechnical Engineering Branch 1 (RGS1)

NRC RAI Number: 02.05.04-4 (eRAI 6006)

FSAR Table 2.5.4-205 presents a summary of general physical and chemical properties test results for each subsurface layer. The staff noticed that no results were provided for the Fort Thompson formation (Layer 4). In accordance with NUREG-0800, Standard Review Plan, Chapter 2.5.4, "Stability of Subsurface Materials and Foundations," please provide these results or justify why these results are not needed.

FPL RESPONSE:

FSAR Table 2.5.4-205 includes the summary of general physical and chemical properties of samples on which grain size distribution and/or Atterberg limits tests were conducted. This table excludes any test results of rock core samples obtained from Fort Thompson and Arcadia strata. Since these are rock cores, there were no sieve analyses or Atterberg limits tests performed or required on samples from Fort Thompson and Arcadia strata. The results of unit weight and calcite content measurements on samples from Fort Thompson and Arcadia are summarized in FSAR Table 2.5.4-207 and FSAR Table 2.5.4-210, respectively

This response is PLANT SPECIFIC.

References:

None

ASSOCIATED COLA REVISIONS:

None

ASSOCIATED ENCLOSURES:

None

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NRC RAI Letter No. PTN-RAI-LTR-040

SRP Section: 02.05.04 - Stability of Subsurface Materials and Foundations

QUESTIONS from Geosciences and Geotechnical Engineering Branch 1 (RGS1)

NRC RAI Number: 02.05.04-21 (eRAI 6006)

The lateral earth pressure diagrams shown in Figure 2.5.4-239 and Figure 2.5.4- 240 indicates that the data source is Reference 205. This reference appears to be unrelated to the subject of the figures. Please clarify.

FPL RESPONSE:

The sample lateral earth pressure diagrams shown in Figure 2.5.4-239 and Figure 2.5.4- 240 were developed using the compacted limerock fill properties summarized in Table 2.5.4-209. Thus, the correct data source should be Table 2.5.4-209.

This response is PLANT SPECIFIC.

References:

None

ASSOCIATED COLA REVISIONS:

The note to FSAR Table 2.5.4-209 will be revised as follows in a future COLA revision.

(a) Properties of Stratum 1 (muck) are not provided as this stratum was removed prior to construction.

The values tabulated for use as design guideline only. Refer to specific boring logs, CPT logs, and laboratory test results for appropriate modifications at specific design locations. USCS = Unified Soil Classification System (ML = silt; MH = silt of high plasticity; GM = silty gravel; GP = poorly graded gravel; SM = silty sand; SW = well graded sand; SP = poorly graded sand)

~~Data from Reference 257~~

The note to FSAR Figure 2.5.4-239 will be revised as follows in a future COLA revision.

~~Data from Reference 205~~ Table 2.5.4-209 for compacted limerock fill

The note to FSAR Figure 2.5.4-240 will be revised as follows in a future COLA revision.

~~Data from Reference 205~~ Table 2.5.4-209 for compacted limerock fill

ASSOCIATED ENCLOSURES:

None