UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

February 9, 2007

Mr. J. A. "Buzz" Miller, Senior Vice President
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SUBJECT: SITE VISIT TO VOGTLE TO OBSERVE COMBINED LICENSE PRE-APPLICATION SUBSURFACE INVESTIGATION ACTIVITIES (PROJECT NO. 755)

Dear Mr. Miller:

On January 8 - 9, 2007, a Region II inspector conducted a visit to the Vogtle site accompanied by members of the Office of New Reactors (NRO) staff. The purpose of the visit was to observe combined license (COL) pre-application subsurface investigation activities being conducted to obtain geotechnical/seismic data to support a COL application for new nuclear power plants. These observations will provide background information for NRC's future review of the expected COL application for the Vogtle site.

A summary of the site visit is enclosed, that includes a list of NRC participants and persons with whom discussions were held.

Sincerely,

**/RA/**

Mark S. Lesser, Chief
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Project No. 755

Enclosure: Site Visit to Vogtle

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Letter to J. A. Miller from Mark S. Lesser dated February 9, 2007

SUBJECT: SITE VISIT TO VOGTLE TO OBSERVE COMBINED LICENSE PRE-APPLICATION SUBSURFACE INVESTIGATION ACTIVITIES (PROJECT NO. 755)

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SITE VISIT TO VOGTLE TO OBSERVE
COMBINED OPERATING LICENSE (COL) PRE-APPLICATION
SUBSURFACE INVESTIGATION ACTIVITIES
PROJECT NUMBER 755

Purpose of Visit:

The information gathering visit was conducted on January 8 - 9, 2007, by a team from the Nuclear Regulatory Commission (NRC), Region II and the Office of New Reactors (NRO). A Region II inspector observed combined license (COL) pre-application subsurface investigation activities conducted to obtain geotechnical and seismic data at the proposed location of new nuclear power plants at the Vogtle site. This visit was an on-site observation and information gathering trip in which the staff used the following inspection manual chapter and procedures as guidance:

- NRC Inspection Manual Chapter 2502, Construction Inspection Program: Pre-Combined License (pre-COL) Phase
- NRC Inspection Procedure 35004, Pre-Docketing Early Site Permit Quality Assurance Controls Inspection
- NRC Inspection Procedure 45051, Geotechnical/Foundation Activities Procedure Review

Principal Persons Contacted:

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Enclosure

Background:

By letter dated July 17, 2006, Southern Nuclear Operating Company informed the NRC staff that it had selected the Vogtle site to be the subject for a COL application, with plans to submit the application in March 2008. A COL is a combined construction permit and operating license with conditions for a nuclear power facility pursuant to 10 CFR Part 52 Subpart C. Southern Nuclear Operating Company has contracted Bechtel as a nuclear services provider, with MACTEC Engineering and Consulting, to conduct the geotechnical site studies required for the COL application.

Overview of Subsurface Investigation Activities Discussed And/or Observed:

Southern Nuclear Operating Company plans to use the subsurface investigations described below to provide geotechnical data to determine suitability of the Vogtle site for a COL for an AP1000 reactor facility. Southern Nuclear Operating Company's current subsurface investigation activities included areas which would be the site of cooling towers, yard structures, and the proposed reactor and power block sites.

The scope of the planned site characterization activities includes various field and geotechnical laboratory tests. Field exploration methods addressed in the Southern Nuclear Operating Company site characterization plan include standard penetration tests, ground water observation wells, seismic downhole velocity measurements (P-S logging), cone penetration tests, and test pit excavation. Proposed geotechnical laboratory tests on soil samples include soil classification, moisture content, direct shear tests, triaxial shear tests, consolidation tests and dynamic tests. Planned testing of rock samples include unconfined compression, with stress-strain measurements, x-ray diffraction, petrographic analysis, and slake durability.

Drilling and Sampling Observations

Drilling and sampling observations by team members during the January 8 - 9, 2007, site trip included locations to be drilled within the site characterization boundary. The team verified that NRC Regulatory Guide (RG) 1.132, "Site Investigations for Foundations of Nuclear Power Plants," was being used as guidance for site investigation activities. The boreholes were being drilled under direction of Bechtel, and their geotechnical engineering subcontractors, MACTEC using rotary drill rig equipment; 34 of the planned 144 boreholes were completed to date, most ranging in depth from 100 feet to 150 feet, four to a depth of 250 feet, and one (at the planned Reactor #3 centerline) to a depth of 400 feet.

The team visited the locations of several borings and observed performance of geophysical testing. The team also examined the site topography and reviewed characterization of geological features identified during preliminary site exploration work.

Soil sampling operations were witnessed and field logs; boring assignment records; and work instructions, including drilling and sampling procedures and field records and sampling control procedures, were reviewed. The team noted that drilling operations are being overseen by MACTEC geotechnical personnel. The team interviewed one of the rig geologists who provided technical oversight of drilling operations. The rig geologist classified soil samples, recorded data on boring logs, and provided assurance that subsurface drilling activities were performed in accordance with applicable procedure requirements and standard geotechnical engineering practices. The team concluded that the individual was knowledgeable in drilling operations and site geotechnical procedural requirements. The team also reviewed the qualification and training records for several MACTEC geotechnical personnel and noted that many had advanced degrees and professional registrations.

The team examined the core boring for location B-1003 (the center of the reactor), which was drilled to a depth of 400 feet prior to the team's arrival. MACTEC is currently in the process of updating the geologic, geophysical, and seismic data base for the Vogtle site.

The inspector reviewed the procedures listed below and discussed technical aspects of the drilling and testing with the MACTEC geotechnical engineers supervising the site investigation. The applicant stated that the site exploration program will be adjusted as necessary to obtain additional information as the site investigation proceeds. The inspector reviewed the MACTEC quality assurance measures being applied to the work and verified that the drilling equipment was in good condition and proper working order. The inspector reviewed the calibration records for the weights (automatic hammers) used for the standard penetration tests. The inspector also reviewed two non-conformance reports and six surveillance reports for issues which had been identified prior to the NRC visit for compliance with the Quality Assurance program.

Drilling and field testing activities were controlled by adequate procedures and standards with an appropriate level of supervisory and quality assurance oversight. The team concluded that the work was being done in an appropriately controlled manner.

## Documents Examined

Specifications and Procedures

Specification No. AR01-0000-XGS-2001, Version 1.0, Specification for Subsurface Investigation and Laboratory Testing for Vogtle Electric Generating Plant - Units 3 and 4, approved 9/20/06

QAP 12-2, Equipment Calibration Documentation Review Procedure, Revision 0, dated 10/17/06

QAP 18-1, Audit Procedure, Revision 0, dated QAP 11-2, Procedure for Control of Software and Hardware, Revision 0, dated 10/17/06

QAP 18-2, Procedure for Qualification of Lead Auditor and Other Audit or Surveillance Personnel, Revision 0, dated 10/17/06

QAP 20-1, Procedure for Qualification of Personnel, Revision 0, dated 10/17/06

QAP 23-1, Procedure for Preparation of a Work Plan, Revision 0, dated 10/17/06

QAP 24-1, Procedure for Preparation of Work Instructions, Revision 0, dated 10/17/06

QAP 25-1, Procedure for Document Control, Revision 0, dated 10/17/06

Vogtle Electrical Generating Plant - 3 and 4 COL Geotechnical Work Plan, Revision 0, dated 10/17/06, plus Attachments listed below:

- Attachment 1, Survey Data Controls
- Attachment 2, Drilling and Sampling Procedures
- Attachment 3, Cone Penetration Tests Procedures
- Attachment 4, Downhole Test Procedures
  - 4.1 Logging Techniques
  - 4.3 Borehole Geophysical Logging
- Attachment 5, Refraction Microtremor (ReMi) Test Procedures
- Attachment 6, Electrical Resistivity Test
- Attachment 7, Field Records and Sample Control Procedures
- Attachment 8, Laboratory Control and Procedures

Non-Conformance and Corrective Action Reports

VG-06-03, SPT Energy Calibration Not Submitted to Southern Nuclear Company Within Seven Days of Mobilization of Drill Rigs, as Required by Section 3.3.8.2 of Specification AR01-0000-XGS-2001, Version 1; approved 12/20/06.

VG-06-04, Field and Test Equipment Calibration Reports Not Submitted to Southern Nuclear Company Seven Days Prior to Use, as Required by Section 5.1.5 and Attachment C, Item 6, of Specification AR01-0000-XGS-2001, Version 1; approved 12/20/06.

Surveillances

V2-01-06, Calibration of Auto-Hammer, dated 11/7-8/06
V2-03-06, Boring Log Review, dated 11/9/06
V2-05-06, Calibration of Auto-Hammer, dated 11/30/06
V2-07-06, Undisturbed Soil Sampling of Geotechnical Boring Locations B-4003, 12/5/06
V2-01-07, Calibration of Auto-Hammer, dated 1/3/07
V2-02-07, Calibration of Auto-Hammer, dated 1/5/07