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

April 16, 2007

Mr. Paul Hinnenkamp, Vice President
Business Development
Entergy Nuclear, Inc.
1340 Echelon Parkway
Jackson, MS 39213

SUBJECT: SITE VISIT TO RIVER BEND TO OBSERVE COMBINED LICENSE PRE-APPLICATION SUBSURFACE INVESTIGATION ACTIVITIES (PROJECT NO. 745)

Dear Mr. Hinnenkamp:

On March 27 - 28, 2007, a Region II inspector conducted a visit to the River Bend site accompanied by members of the Office of New Reactors (NRO) staff (on March 28). 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 River Bend 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
Construction Inspection Branch 1
Division of Construction Inspection

Project No. 745

Enclosure: As stated

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ADAMS: ☐ Yes ACCESSION NUMBER: **ML071070422**

OFFICE	RII:DCI		HQ:NRO		RII:DCI							
SIGNATURE	MSL for RPC		TAK via e-mail		MSL							
NAME	R Carrion		TKevern		MLesser							
DATE	4/16/07		4/13/07		4/16/07							
E-MAIL COPY?	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO

OFFICIAL RECORD COPY DOCUMENT NAME: C:\FileNet\ML071070422.wpd

SITE VISIT TO RIVER BEND TO OBSERVE
COMBINED LICENSE (COL) PRE-APPLICATION
SUBSURFACE INVESTIGATION ACTIVITIES
PROJECT NUMBER 745

Purpose of Visit:

The information gathering visit was conducted on March 27 - 28, 2007, by a team from the Nuclear Regulatory Commission (NRC), Region II and the Office of New Reactors (NRO). A Region II inspector observed limited combined license (COL) pre-application subsurface investigation activities conducted to obtain geotechnical and seismic data at the proposed location of a new nuclear power plant at the River Bend 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:

A. Layfield, Black and Veatch
J. Caldwell, Black & Veatch
G. Zinke, Entergy Nuclear
G. Young, Entergy Nuclear
L. Drbal, Black and Veatch
A. Blanco, Black and Veatch

NRC Inspector:

R. Carrion, Sr. Reactor Inspector, RII

NRC Accompanying Personnel:

T. Kevern, Project Manager, NRO
T. Cheng, NRO
A. Johnson, NRO
Y. Li, NRO
S. Parra, RII

Enclosure

Background:

By letter dated July 17, 2006, Entergy Nuclear informed the NRC staff that it had selected the River Bend site to be the subject for an ESBWR COL application, with plans to submit the application in May 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. Entergy Nuclear has contracted Black and Veatch as a nuclear services provider, with Professional Service Industries, Inc (PSI), to conduct the geotechnical site studies required for the COL application.

Overview of Subsurface Investigation Activities Discussed and/or Observed:

Entergy Nuclear plans to use the subsurface investigations described below to provide geotechnical data to determine suitability of the River Bend site for a COL for an ESBWR reactor facility. Entergy Nuclear'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 site characterization plan include standard penetration tests, ground water observation wells, seismic downhole velocity measurements (P-S logging), cone penetration tests, and borehole pressuremeter tests. Proposed geotechnical laboratory tests on soil samples include soil classification, moisture content, direct shear tests, triaxial shear tests, consolidation tests and dynamic tests and will performed by PSI under contract with Black and Veatch.

Drilling and Sampling Observations

Drilling and sampling observations by team members during the March 27 - 28, 2007, site trip were not conducted due to schedule and technical difficulties experienced by the drill rigs on site. However, the team did review the boring hole plan and 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 the direction of Black and Veatch, and their geotechnical engineering subcontractor, PSI, using rotary drill rig equipment. All 29 new boreholes were completed to date, ranging in depth from 35 feet to 430 feet, but not all testing had been completed. In addition, two seismic holes (TB-10 and RB-31), which were to be bored to a depth of 550 feet, had not been completed to date due to technical problems with the drill rigs. Also, the information from 20 existing borings, originally done years ago in preparation for a second unit at the site, were being used as part of the geotechnical investigation.

The team visited the locations of several drilling sites and reviewed soil samples from core borings. The team also examined the site topography and reviewed characterization of geological features identified during preliminary site exploration work.

Although field operations were not witnessed, field logs, boring assignment records, work instructions, drilling and sampling procedures, and sampling control procedures were reviewed. In addition, the team interviewed one of the rig geologists who was responsible for providing technical oversight of drilling operations. The rig geologist was responsible for classifying soil samples, recording data on boring logs, and providing 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 three Black and Veatch geotechnical personnel and noted that all had advanced degrees and/or professional registrations.

PSI is currently in the process of updating the geologic, geophysical, and seismic data base for the River Bend site.

The inspector reviewed the documents listed below and discussed technical aspects of the drilling and testing with the Black and Veatch geotechnical engineers supervising the site investigation. The inspector reviewed the Black and Veatch quality assurance measures being applied to the work. The inspector reviewed the calibration records for the weights (automatic hammers) used for the standard penetration tests. The inspector also reviewed two surveillance reports for COL Project site activities relative to the installation and data collection processes for geotechnical activities in accordance with specifications 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

Black and Veatch Nuclear Organization Quality Assurance Manual, Revision 2, dated January 23, 2006

Black and Veatch Nuclear Procedures Manual, Revision 1, dated March 8, 2007

Black and Veatch Document No. 145885.21.2001, River Bend Project Hydrogeology Data Collection Plan, Revision 0, dated November 2, 2006

Black and Veatch Document No. 145885.21.2003, River Bend Project Geotechnical Data Collection Plan, Revision 2, dated February 27, 2007

Black and Veatch Nuclear Organization Surveillance Report, River Bend COL, Record No.: SR-00003, dated December 8, 2006

Black and Veatch Nuclear Organization Surveillance Report, River Bend COL, Record No.: SR-00005, dated February 19, 2007

Selected Black and Veatch Personnel Qualifications

Calibration report for the Central Mine Equipment CME-75 and Simco 2800 “truck mounted” drill rigs equipped with CME automatic type hammers of 0.14 kip hammer weight and a 30-inch drop height, dated November 20, 2006

Calibration report for a Simco 2800 “ATV” drill rig equipped with a CME automatic type hammers of 0.14 kip hammer weight and a 30-inch drop height, dated December 7, 2006

Site Instruction 2007-009, for Boring CB-22

Site Instruction 2007-020, for Boring FB-38

Site Instruction 2007-023, for Boring TB-06

Site Instruction 2007-024, for Boring RB-24