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

August 22, 2006

Marilyn C. Kray, President
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M/S KSA 3-N
200 Exelon Way
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SUBJECT: PRE-APPLICATION SITE VISIT TO THE BELLEFONTE SITE TO OBSERVE COMBINED LICENSE PRE-APPLICATION SUBSURFACE INVESTIGATION ACTIVITIES (PROJECT NO. 740)

Dear Ms. Kray:

On July 10 - 11, 2006, a U. S. Nuclear Regulatory Commission (NRC) inspector from Region II conducted a site visit to the Bellefonte site accompanied by members of the NRC's Office of Nuclear Reactor Regulation (NRR) 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 Bellefonte site.

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

Sincerely,

/RA/

Mark S. Lesser, Branch Chief
Division of Reactor Safety

cc w/encl: (See next page)

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☐ PUBLICLY AVAILABLE ☐ NON-PUBLICLY AVAILABLE ☐ SENSITIVE ☐ NON-SENSITIVE

ADAMS: ☐ Yes ACCESSION NUMBER:_____

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E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: C:\ADAMS\Cache\ML0623500210.wpd

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PRE-APPLICATION SITE VISIT TO THE BELLEFONTE SITE
TO OBSERVE COMBINED LICENSE (COL) PRE-APPLICATION
SUBSURFACE INVESTIGATION ACTIVITIES
PROJECT NO. 740

Purpose of Visit:

This information gathering visit was conducted on July 10-11, 2006, by staff of the Nuclear Regulatory Commission (NRC), Region II and the Office of Nuclear Reactor Regulation (NRR). 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 Bellefonte 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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J. Davis, TVA
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Enclosure

Background:

By letters of December 7, 2004, and November 17, 2005, NuStart Energy informed the NRC staff that it had selected the Bellefonte site to be the subject for a COL application, with the intent of submitting the application in late 2007. 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. NuStart Energy has contracted Enercon Services, Inc. as a nuclear services provider. MACTEC Engineering and Consulting, and William Lettis and Associates (WLA) were contracted by Enercon to conduct the geotechnical site studies required for the COL application.

Overview of subsurface investigation activities discussed and/or observed:

NuStart plans to use the subsurface investigations described below to provide geotechnical data to determine suitability of the Bellefonte site for a COL for an AP1000 reactor facility. NuStart'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 NuStart site characterization plan include standard penetration tests, rock coring, ground water observation wells, seismic downhole velocity measurements (P-S logging), spectral analysis of surface waves (SASW), cone penetration tests, borehole packer tests, seismic refraction and gravity, and test pit excavation. Proposed geotechnical laboratory tests include soil classification, grain size, moisture content, direct shear tests, triaxial shear tests, proctor, 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 July 10 and 11, 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 NuStart, and their geotechnical engineering subcontractors, MACTEC and, William Lettis & Associates (WLA) using rotary drill rig equipment.

The team visited the locations of several borings. The team observed drilling of boring number B-1001 from an approximate depth of 8.5 to 17 feet, top of rock. Top of rock was determined by refusal in the SPT which was defined as in excess of 50 blows per 6 inches, and refusal to the soil boring auger. Performances of 4 standard penetration tests at 8.5, 11.0, 14.5, and 16.5 feet were also observed. The team determined that the sample spacing was in accordance with the guidance in RG 1.132. Disturbed samples were collected from this operation using a split-barrel sampler. Jar samples were collected, and stored in accordance with ASTM D4220, Standard Practices for Preserving and Transporting Soil Samples. The team verified field soil classification was performed in accordance with ASTM D2487, Unified Soil Classification System. One observation of the team was that the rig geologist for boring B-1001 was not independently verifying the standard penetration test counts, and had not independently measured the depth where the SPT was performed. This observation was discussed with the applicant who indicated that the issue would be documented in a nonconformance report and additional instructions would be provided to the rig geologists.

The team reviewed the boring log for boring B-1006, which was completed prior to the team's arrival. The team also examined disturbed soil samples collected from a split spoon sampler from Boring B-1006, and the rock core samples.

The team noted that drilling operations are being overseen by MACTEC or WLA geotechnical

personnel. These individuals classify soil samples, record data on boring logs, and provide assurance that subsurface drilling activities are performed in accordance with applicable procedure requirements and standard geotechnical engineering practices. The team reviewed the training and qualification records for six rig geologists and concluded that these individuals were qualified to perform their duties.

The team discussed the methods used to accurately locate the drill holes with the applicant's personnel. A series of surveying monuments has been established on the site which were used to locate and determine the elevation of the borings. Following competition of the exploration activities, the applicant stated that locations and elevations of the completed borings and observation wells will be verified by surveyors. The geotechnical procedures require the survey work to be performed under the supervision of a licensed land surveyor. Survey accuracy is specified at Third Order accuracy, (1:5000) horizontal, and to the nearest 0.1' vertical control.

The team reviewed the procedures listed below and discussed technical aspects of the drilling and testing with the MACTEC and WLA geotechnical engineers supervising the site investigation. The applicant stated that site exploration program will be adjusted as necessary to obtain additional information as the site investigation proceeds. Discussions with the applicant disclosed that ground water elevation in the observation wells will be monitored periodically. The team reviewed the MACTEC quality assurance measures being applied to the work. The team verified that the drilling equipment was in good condition and proper working order. The team reviewed the calibration records for the weights (automatic hammers) used for the standard penetration tests. The team also reviewed a nonconformance report which had been identified prior to the NRC visit, and reviewed audits performed by MACTEC and Enercon quality assurance personnel.

All drilling and field testing activities appeared to be controlled by adequate procedures and standards, with an appropriate level of supervisory and quality assurance oversight. Except for the lack of independent observation/verification of drilling activities by the rig geologist for boring B-1001, the team considered all observations of work adequate.

Documents Examined

Enercon Services, Inc, QA Project Planning Document for NuStart Combined License Application Development Project, Project No. NuStart-001, Rev. 0, dated 3/8/06

NuStart Bellefonte COL Project - Geotechnical Work Plan, Rev. 0, dated 4/17/06

Geotechnical Data Collection Plan, NuStart/Enercon Combined Operating License Application, Bellefonte Nuclear Project, Rev. 2, dated 7/6/06

MACTEC Quality Assurance Manual, Rev. 1, dated 6/17/05

MACTEC Quality Assurance Project Document, Geotechnical Services, NuStart-Bellefonte COL Project, MACTEC Project 6468-06-1299, dated 4/14/06, plus Attachment, listed below:

Attachment 1, Survey Data Control

Attachment 2, Drilling and Sampling

Attachment 3, Cone Penetration Tests

Attachment 4, Downhole Testing Procedures: 4.1, Packer; 4.2, Goodman Jack; 4.3, P-S Logging; & 4.4, Televiewer

Attachment 5, Surface Geophysics

Attachment 6, Geological Mapping

Attachment 7, Field Reconnaissance

Attachment 8, Laboratory Controls and Test Procedures

Work instructions for Boring B-1006

Nonconformance Reports

Packer Test in Boring B-1083 Performed at Incorrect Elevation

Quality Assurance Surveillance Reports

Enercon Surveillance numbers BNL-SURV-2006-05 and BNL-SURV-2006-08

MACTEC Surveillance numbers 1 through 7