UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

August 19, 2002

MEMORANDUM TO: James E. Lyons, Director
New Reactor Licensing Project Office
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

THROUGH: Ken E. Brockman, Director ***/RA/***
Division of Reactor Projects

THROUGH: William D. Johnson, Chief ***/RA/***
Project Branch A
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FROM: Charles J. Paulk, Senior Project Engineer ***/RA/***
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SUBJECT: PRE-APPLICATION SITE VISIT TO GRAND GULF NUCLEAR STATION FOR FAMILIARIZATION WITH GEOTECHNICAL DATA GATHERING PROCESSES FOR EARLY SITE PERMIT

Entergy Nuclear Potomac was created by Entergy Operations, Inc., to pursue the development and submission of an Early Site Permit in accordance with 10 CFR Part 52, Subpart A. Entergy Nuclear Potomac has contracted Enercon Services (Enercon) to develop the application, utilizing the Enercon quality assurance program, as necessary, for the collection and analysis of data required to support the application. An application for an early site permit does not imply that an applicant has decided to build a nuclear power plant on the site. It is a process by which an applicant can obtain approval of a site that would be suitable to place a nuclear power plant if such a decision would be made within the life of the permit.

On August 1-2, 2002, I accompanied Mr. R. Jenkins, Project Manager, and Dr. J. Ma, Structural Engineer, to the Grand Gulf Nuclear Station. The purpose of this visit was to observe activities associated with the gathering of data for demonstrating the suitability of a potential site for placement of a nuclear power plant. These observations will provide background information for the NRR reviewer after an application is received.

The staff noted that the applicant's plans were to drill three holes and perform four cone penetrometer tests in what was designated as the proposed power block area. The intent, as we were able to understand, was to demonstrate a correlation with the data gathered during the initial siting for the existing plant. Such correlation would, in the applicant's mind, minimize the effort required on their part to demonstrate the seismic and geological acceptability of the proposed site.

The staff requested, and obtained, a copy of project instructions for the early site permitting project of Grand Gulf Nuclear Station Site on August 1, 2002. The project instructions for the geologic, geotechnical, and geophysical field exploration and sampling used at the site were provided in Enercon's Procedure PPD ENTO-002, "Early Site Permitting Project Grand Gulf Nuclear Station Site," Revision 2. The project instructions called for three exploratory borings, with seismic wave velocity surveys in the exploratory boreholes, and four cone penetrometer tests. Field activities were directed by William Lettis & Associates, Inc.

Exploratory borings and cone penetrometer tests were conducted on August 1-2, 2002, during the time of the staff visit. The first boring (identified as B-1) and the first cone penetrometer test (identified as CPT-1) had been completed before the staff arrived. During this visit, we observed the performance of two cone penetrometer tests (identified as CPT-2 and CPT-3) and the partial drilling of a test hole (identified as B-2) with the collection of soil samples. The purpose of the exploratory boring is to characterize subsurface geologic conditions, perform in-situ testing, perform borehole geophysical surveys, and obtain soil samples for laboratory testing. The staff saw several wood boxes of soil samples from B-1 that were stored in a shaded area, awaiting shipment to the University of Texas at Austin for dynamic soil testing. Each box contained several plastic tubes of soil samples. Each tube was marked and sealed with waxed at both ends to prevent the escape of moisture from the soil. The soil samples appeared to be properly sealed and packed. The staff witnessed the drilling of B-2. Geologists were present during the drilling of B-2, as required by the project instructions.

Drilling of B-2 ran into problems. The first problem was that the soil around the hole became unstable. Bentonite grout mix was injected into the soil to stabilize it. The second problem was jamming of the equipment, which was used to core the soil samples, at approximately 150 feet. Field crews were trying to resolve the problems when the staff left the site. Therefore, the staff did not witness the soil samples taken from B-2, or the measurement of seismic wave velocity profiles because the B-2 hole was not cleared.

The cone penetrometer test was performed using a penetrometer tip with a conical point having a 60° apex angle and a cone base to advance through the soil at a constant rate. The data provided a detailed record of cone resistance which is useful for evaluation of site stratigraphy, homogeneity and depth to firm layers, voids or cavities, and other discontinuities. The cone penetrometer test provides a rapid method for determining subsurface in-situ conditions without the need of obtaining soil samples. On August 1, 2002, CPT-2 thru 4 were completed in one day. The crew performing these tests cleaned the equipment before testing. Notes regarding equipment response and penetration were recorded by a geologist during each sounding. The geologist directed the entire test.

During the observed cone penetrometer tests, the staff noted that the attained depth was approximately 100 feet. The geologist stated that, at that depth, they had hit a formation of gravel and that the penetrometer could not go any further without sustaining damage. The data generated from the test equipment was recorded electronically by the test equipment and manually by the geologist for future reviews and analyses.

The staff inquired about the data correlation between B-1 and CPT-1 because the two locations were near each other. While the data was preliminary, the geologists stated that the data correlations were excellent and most blow count numbers (a measure of soil density) between

the two methods appeared to be within 5 percent. The staff also inquired whether the preliminary data from B-1 and CPT 1 thru 4 compared well with previous data obtained for the existing plant or not. The geologists indicated that the raw data they had obtained had compared favorably with the previous data.

The staff was provided with information on the construction and use of the instrument that was to be used to obtain seismic wave velocity data of the ground formations surrounding the drill holes. This was necessary because the drilling operation had fallen behind schedule due to mechanical problems with the drilling rig.

In addition to observing the collection of geotechnical data, we toured the area where a proposed circulating water intake canal would be located. We also toured the area where the existing meteorological tower was located. These tours were performed to become familiar with their locations.

In general, the staff did not identify any significant concern relating to the conformance of work in progress with the procedures developed for performing the boring and collection of geotechnical data.

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