



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

August 8, 2007

Mr. Douglas R. Gipson,
Executive Vice President, Power Generation
Business Development
DTE Energy
6400 N. Dixie Highway
Newport, MI 48166

SUBJECT: AUDIT OF COMBINED LICENSE PRE-APPLICATION SUBSURFACE
INVESTIGATION ACTIVITIES AT FERMI (PROJECT NO. 757)

Dear Mr. Gipson:

On July 9 - 11, 2007, Region II inspectors conducted an audit at the Fermi site accompanied by members of the Office of New Reactors (NRO) staff (on July 10 - 11). The purpose of the audit was to observe combined license (COL) pre-application subsurface investigation activities being conducted to obtain geotechnical/seismic data to support a COL application for a new nuclear power plant. These observations will provide background information for the NRC's future review of the expected COL application for the Fermi site.

Enclosure 1 is a summary of the audit and includes a list of NRC participants and persons with whom discussions were held. Enclosure 2 is the handout provided to the NRC team, NRC Onsite Review Geotechnical/ Hydrogeology Investigation Activities July 10-11, 2007.

Sincerely,

/RA/

Mark S. Lesser, Chief
Construction Inspection Branch 1
Division of Construction Inspection

Project No. 757

Enclosures: As stated

cc w/encls: (See next page)

COL Entergy Nuclear

2

cc w/encls:

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and Chief Nuclear Officer,
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DOCUMENT NAME: C:\FileNet\ML072210911.wpd

AUDIT OF COMBINED LICENSE (COL) PRE-APPLICATION
SUBSURFACE INVESTIGATION ACTIVITIES AT FERMI
PROJECT NUMBER 757

Purpose of Audit:

The audit was conducted on July 9 - 11, 2007, by a team from the Nuclear Regulatory Commission (NRC) Region II office and the Office of New Reactors (NRO). The team consisted of construction inspection personnel; and specialists in geology, engineering geology, and geotechnical engineering. The team attended a presentation on regional and site geology, current site characterization efforts (consisting primarily of a drilling program at this stage), and future site characterization plans. The team also observed in-progress 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 Fermi site. This audit 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:

P. Smith, Detroit Edison (DTE)
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W. Wang, DSER/RGS1

Background:

By letter dated February 15, 2007 (ML070600142), DTE Energy informed the NRC staff that it had selected the site of Detroit Edison's Fermi 2 Nuclear Plant to be the subject for a combined license (COL) application, with plans to submit the application in the fourth quarter of 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. Detroit Edison has contracted Black and Veatch as a nuclear services provider to conduct activities necessary to submit a COL application to the NRC, including the geotechnical site studies required for that application. Black and Veatch has contracted with other companies, including Boart Longyear (for drilling); Professional Service Industries, Inc (PSI) (for laboratory testing services); Geomatrix Consultants (for seismic characterization); etc. to complete the contract.

Overview of Subsurface Investigation Activities Discussed and/or Observed:

Although the specific reactor technology to be used is currently under corporate review, Detroit Edison plans to use the subsurface investigations described below to provide geotechnical data, including subsurface geology, ground water hydrology, and geotechnical material properties through borings, geophysical borehole logging, borehole hydrologic monitoring, and field and laboratory testing to determine the suitability of the Fermi site for a COL for a new reactor facility. Hydrogeologic investigations included in-situ testing to determine sub-surface hydraulic properties, such as porosity and hydraulic conductivity. Characterization of the area hydrogeology indicated that there is a potential for solution channels in portions of the Salinas formation, which has considerable dolomite, limestone, and breccia among other formation types. There are also some possibilities for fracture-induced secondary porosity. In addition, the possibility of groundwater flow reversal was identified by the applicant and this will be addressed in subsequent detailed investigations. Discussions regarding the importance of sufficient site characterization, data collection, analysis, modeling, and development of alternate conceptual models were held with the DTE staff with emphasis on the NRC Standard Review Plan, specifically hydrologic safety reviews. Additional topics of discussion included: the spatial and temporal coverage of the data; alternate conceptual models to establish a framework that properly identifies the physical, hydrologic, hydrogeologic, and geochemical processes which have safety-related implications; models that describe the groundwater flow regime and identify pathways; and impacts from the previous developments in the area which have the potential to alter the hydrology of the site.

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.

Detroit Edison's subsurface investigation activities were being conducted in areas where the proposed cooling towers, yard structures, and reactor and power block had been sited.

Drilling and Sampling Observations

Drilling and sampling operations were witnessed by team members during the audit. Field logs; boring assignment records; and work instructions, including drilling and sampling procedures and field records and sampling control procedures, were reviewed for procedural compliance. Also, the team reviewed 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. All 28 (11 deep and 17 shallow) planned hydrogeologic monitoring wells had been completed and the process of monitoring the groundwater for a one-year period had begun. Borehole drilling continued by Boart Longyear, under the direction of Black and Veatch, using rotary drill rig equipment. Drilling had begun in mid-June and

several boreholes (including one (RB-C8) of the two seismic holes) had been completed to date, ranging in depth from 35 feet to 470 feet, but not all testing had been completed. Drilling of the others was in progress, including the other seismic hole (TB-C5). The team examined the 470-foot core sample from seismic hole RB-C8.

Field operations were witnessed at locations TB-C5 and RB-C4, and field logs, boring assignment records, work instructions, drilling and sampling procedures, and sampling control procedures were reviewed for program compliance. In addition, the team interviewed one of the rig geologists who was responsible for providing technical oversight of drilling operations, including 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 several Black and Veatch geotechnical personnel and noted that all had advanced degrees and/or professional registrations.

The team reviewed the sample storage facilities. A temporary field facility had been established in equipment trailers near the borehole site. The permanent storage facility had been established at a DTE corporate warehouse located offsite. However, due to the breakdown of loading equipment at that warehouse while transporting a group of samples, an onsite warehouse was also serving as temporary storage facility until the loading equipment could be repaired. The team also reviewed sample identification information on the sample packaging and examined warehouse storage location sample logs and found them to be adequate. The team concluded that the samples were adequately stored.

The team 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 team reviewed the Black and Veatch quality assurance measures being applied to the work. The team reviewed the calibration records for the weights (automatic hammers) used for the standard penetration tests. The team also reviewed one surveillance report and one audit conducted by Black and Veatch 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.

Records Examined

- Black and Veatch Nuclear Organization Quality Assurance Manual, Revision 2, dated January 23, 2006
- Black and Veatch Nuclear Organization - Detroit Edison Fermi 3 Geotechnical Investigation
- 147483.21.2003, Geotechnical Data Collection Plan, Revision 1
- 147483.21.2004, Geotechnical Work Plan, Revision 1
- 147483.33.0272, Geotechnical Investigation Specification, Revision 0
- 1474833-3STX-S0008, ESBW Geotechnical Investigations Locations, Revision 1
- 1474833-3STX-S0009, ABRW Geotechnical Investigations Locations, Revision 1
- 1474833-3STX-S0010, Geotechnical Investigations Underground Utility Overlay, Revision 1
- 1474833-3STX-S0011, Common Geotechnical Investigations Locations, Revision 0
- Resumes and qualifications for drill operators
- Black and Veatch Nuclear Organization - Detroit Edison Fermi 3 Project Management Memorandum, Revision 1
- Black and Veatch Audit Report 06NS06 of PSI
- Black and Veatch Surveillance Report - Review of Boart Longyear Quality Control Plan
- Nuclear Organization Corrective Action Program Nuclear Program (NP) 16.1, Revision 3
- Nuclear Organization Quality Assurance Program, Reporting of Defects and Noncompliances Under 10CFR Part 21 and Part 50.55(e), NP 16.2, Revision 1
- Nuclear Organization Quality Assurance Program, Conflict Resolution, NP 16.3, Revision 1
- Nuclear Organization Quality Assurance Program, Audit Performance, NP 18.1, Revision 1
- Nuclear Organization Quality Assurance Program, Surveillance, NP 18.2, Revision 1
- Nuclear Organization Quality Assurance Program, Escalation Process, NP 18.3, Revision 1
- Drawing Number 147483-3STX-S0011, Common Geotechnical Investigation Locations, Revision 0
- Drawing Number 147483-3STX-S0001, Hydrogeology Investigation Locations, Revision 3