

March 14, 2013

MEMORANDUM TO: Ronaldo V. Jenkins, Branch Chief
Licensing Branch 3
Division of New Reactor Licensing
Office of New Reactors

FROM: Tekia Govan, Project Manager **/RA/**
Licensing Branch 3
Division of New Reactor Licensing
Office of New Reactors

SUBJECT: MARCH 19, 2013, AUDIT PLAN TO REVIEW SASSI2010
VERIFICATION AND VALIDATION DOCUMENTATION

DTE Electric Company has procured SASSI2010 to be used for Soil Structure Interaction (SSI) analyses in support of the Fermi 3 Combine License application. In recent public teleconferences, the U.S. Nuclear Regulatory Commission staff has communicated with the DTE Electric Company on its expectations with respect to the quality and applicability of the SASSI2010 to address the Fermi 3 site conditions. The purpose of this audit is to review the SASSI2010 verification and validation documentation to confirm that the SASSI code is adequate for the Fermi 3 site conditions and SSI analysis cases. The audit will take place at the Sargent and Lundy office in Chicago, IL on March 19 through March 21, 2013. A copy of the audit plan and agenda are enclosed.

Docket Nos.: 52-033

Enclosures:
As stated

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cc w/encl: See next page

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ADAMS ACCESSION NO.: ML13071A181

NRO-002

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DATE	03/12/2013	03/12/2013	03/12/2013	03/12/2013	03/14/2013

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AUDIT PLAN TO REVIEW SASSI2010 VERIFICATION AND VALIDATION DOCUMENTATION

A. Background

DTE Electric Company has procured SASSI2010 to be used for Soil Structure Interaction (SSI) analyses in support of the Fermi 3 Combine License application. In recent public teleconferences, the U.S. Nuclear Regulatory Commission (NRC) staff has communicated with the DTE Electric Company on its expectations with respect to the quality and applicability of the SASSI2010 to address the Fermi 3 site conditions. The purpose of the audit is to review the SASSI2010 verification and validation documentation to confirm that the SASSI code is adequate for the Fermi 3 site conditions and SSI analysis cases.

Generic test problems will be reviewed only to the extent that they address the program features used in the Fermi 3 site conditions and SSI analysis cases.

B. Regulatory Audit Bases

10 CFR Part 50, Appendix B, requires, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculation methods or by the performance of a suitable testing program. Appendix B to SRP Section 3.8.4 provides requirements and guidelines for implementation of structural design audits. These documents as stated above, provides the regulatory audit bases for this scheduled audit.

C. Regulatory Audit Scope or Methodology

DTE Electric Company submitted to the NRC a verification and validation (V&V) plan (NRC3-13-0005) for SASSI2010 to be used for SSI analyses in support of the Fermi 3 COL application. The scope of this audit is to review the SASSI2010 V&V documentation to verify that the SASSI code is adequate for the Fermi 3 site conditions and SSI analysis cases. Specifically, the staff will review the supporting documentations and related test problems to verify that they address the program features used in the Fermi 3 site conditions and SSI analysis cases. The specific audit areas are listed in the audit plan. Any significant findings during the audit will be documented in the audit report and RAIs may be issued if necessary.

D. Information and Other Material Necessary for the Regulatory Audit

The NRC understands that the entirety of the SASSI2010 V&V documentation, including calculations, is in Sargent & Lundy document SVVR03.7.316-1.0-250USER-M01, "Validation of SASSI2010 Version 1.0-250USER-M01," which is completed and available for NRC audit. Two hard copies of this documentation should be made available for review during the audit.

As noted during the teleconference with the NRC staff held on February 21, 2013, the following items should be ready to be addressed by the applicant during this audit:

- Input motions with non-negligible energy content up to 50 Hz, especially in the vertical direction may require SSI models with passing frequencies of 50 Hz. V&V should address frequency range of interests at the Fermi site.
- V&V should address the range of Poisson's Ratio of interest at the Fermi 3 site.
- Sharp contrast in stiffness between adjacent backfill layer and rock layer was noted. The ratio of shear wave velocities is in the order of 1 to 9. V&V should address this sharp contrast.
- Depth to half-space interface is noted to be approximately 430 ft. V&V should address whether the solution is sensitive to the location of the half-space interface applicable to Fermi site
- V&V should address effect of the aspect ratio and minimum dimension of the solid brick elements that will be used to model the excavated soil/rock volume on SSI models
- It appears that geometric distortion of non-rectangular brick elements is not an issue given the rectangular geometry of the footprints of the various structures that will be analyzed for the Fermi 3 project. However, if this is not the case, then the geometry of the most distorted brick element in the mesh should also be validated.

Note: The V&V report indicates that the scope of the V&V plan includes the SASSI2010 Subtraction Method (SM). It is not clear what this validation entails and how it relates to the Fermi 3 project. It is our understanding that the Modified SM (not the SM) is being benchmarked relative to the DM in a separate analysis effort using a reduced model of the Fermi RB/FB, which is thus only applicable to this specific structure and site conditions.

Special Requests

The NRC requests that DTE Electric Company provide:

- A working space for the duration of the audit at the Sargent & Lundy office.
- A small private conference room for NRC internal discussions
- A telephone for contacting NRC staff and HQ
- A teleconference line for the audit entrance and exit meetings

E. Audit Team

The audit team will include:

- Tekia Govan, Project Manager (NRC)
- Manas K Chakravorty, Technical Reviewer (NRC)
- Manuel Miranda, NRC Contractor (BNL)
- Carl Costantino, NRC Contractor (BNL)

F. Logistics

Date: March 19, 2013 through March 21, 2013

Time: varies per day, see agenda

Location: Sargent and Lundy Offices
55 E. Monroe Street
Chicago, IL

Point-of-Contact: Michael Brandon, DTE Electric Company
Ryan Pratt, DTE Electric Company

G. Deliverables

Within 90 days of completion of the audit, the audit team will generate an audit results summary report (ARSR). The ARSR will provide a list of documents audited by the audit team, confirmation that sufficient information has been collected, and document that information required for the NRC staff to complete their review of the SSI analysis for the Fermi 3 application.

**AGENDA FOR
FERMI 3: REVIEW SASSI2010 VERIFICATION AND VALIDATION
DOCUMENTATION**

March 19 through March 21, 2013

(Times are subject to change based on the progress of audit.)

Tuesday, March 19, 2013

- Entrance Meeting (1:30-2:00pm)
 - Introductions
 - Purpose and Objectives of Audit
 - Review of Audit Plan and Schedule
 - Contacts for DTE, S&L, GEH, and NRC
- Overview of SASSI2010 V&V test problems and calculations (S&L) (2:00-3:00pm)
- Review of calculations supporting acceptability of computed solutions up to highest frequency of interest at the Fermi site (NRC/BNL) (3:00-4:30pm)
- NRC Staff Caucus (4:30-5:00pm)
- Summary of the Day and Action Items (5:00-5:30pm)

Wednesday, March 20, 2013

- Follow up on Previous Day's Action Items/Plan of the day (8:30-9:00am)
- Continue review of calculations supporting acceptability of computed solutions up to highest frequency of interest at the Fermi site (NRC/BNL) (9:00-10:30am)
- Review of calculations supporting acceptability of computed solutions for full range of Poisson's ratios of interest at the Fermi site (NRC/BNL) (10:30am-12:00pm)

Lunch (12:00-1:00pm)

- Continue review of calculations supporting acceptability of computed solutions for full range of Poisson's ratios of interest at the Fermi site (NRC/BNL) (1:00-2:00pm)
- Review of calculations supporting sensitivity of computed solutions to location of half-space interface, as applicable to Fermi site (NRC/BNL) (2:00-4:30pm)
- NRC Staff Caucus (4:30-5:00pm)
- Summary of the Day and Action Items (5:00-5:30pm)

Thursday, March 21, 2013

- Follow up on Previous Day's Action Items/Plan of the day (8:30-9:00am)
- Review of calculations supporting acceptability of computed solutions for case of sharp contrast in stiffness between adjacent soil layers, as applicable to the Fermi site (NRC/BNL) (9:30-11:00am)
- Review of calculations supporting acceptability of computed solutions for the types of elements that may be used in the model, aspect ratio, minimum dimension, or maximum distortion of the 3D solid elements that will be used to model excavated volume at the Fermi site (NRC/BNL) (11:00am-12:00pm)

Lunch (12:00-1:00pm)

- Continue review of calculations supporting acceptability of computed solutions for aspect ratio, minimum dimension, or maximum distortion of the 3D solid elements that will be used to model excavated volume at the Fermi site (NRC/BNL) (1:00-2:30pm)
- Summary of the Day and Action Items (2:30-4:00pm)
- NRC Staff Caucus (4:00-4:30pm)
- Exit Meeting (5:00-5:30pm)

DTE Electric Company - Mailing List
cc:

(Revised 01/29/2013)

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