Enrico Fermi Nuclear Power Plant Unit 3
Seismic Analysis and Licensing Support Project Profile

Client:

DTE Electric Company

Project Name:

Enrico Fermi Unit 3 Seismic Analysis and Licensing Support

Location:

Monroe County, Michigan

Licensing Schedule:

2009 - 2015

Project Description:

Sargent & Lundy has been supporting DTE Electric Company (DTE) in their development of the Combined Operating License Application (COLA) for Fermi 3. This proposed new unit is based on the advanced-design GE Hitachi Nuclear Energy ESBWR (Economic Simplified Boiling Water Reactor).

A key facet of our support has been performing the site-specific seismic analysis of the seismic Category I structures and providing technical support for these analyses through completion of the licensing of Fermi 3.

Scope of Services:

Our scope included performing site-specific soil-structure interaction (SSI) analysis of the ESBWR for the conditions at the Fermi 3 site to address partial embedment of seismic Category I structures into rock using Central and Eastern U.S. Seismic Source Characterization (CEUS SSC)-based inputs. This analysis was undertaken in response to the 2012 Fukushima Near-Term Task Force Recommendation 2.1, which required evaluation of the CEUS SSC model.

Sargent & Lundy worked with DTE to develop a plan to complete the analyses and prepare and submit licensing documentation to the NRC. Following a planning meeting with the NRC, we performed the analyses with SASSI2010, developed the responses to NRC Requests for Additional Information (RAIs), and revised the Fermi 3 FSAR (Final Safety Analysis Report). During this process, we participated in NRC staff audits and in public meetings. After NRC staff acceptance of the analysis, our team supported technical presentations to the Advisory Committee on Reactor Safeguards (ACRS) and supported Mandatory Hearings before the Commissioners.

Deliverables included various SSI analyses and evaluation of these analyses to demonstrate the adequacy of the ESBWR standard plant design at the Fermi 3 site.

55 East Monroe Street • Chicago, IL 60603-5780 USA • 312-269-2000 • www.sargentlundy.com

Principal deliverables included:

- Calculations and reports for the SSI analysis for the reactor building/fuel building and for the control building considering different soil and backfill assumptions.
- Calculations and reports evaluating the reactor building/fuel building and control building dynamic bearing capacity, foundation stability, and wall seismic soil pressures.
- Calculations and reports documenting sensitivity studies of the seismic interaction between adjacent structures.
- Preparation of responses to RAIs and material for inclusion in the FSAR documenting the analysis.
- Preparation of presentation materials for NRC public meetings, NRC staff audits, and ACRS meetings.

Project Highlights:

Sargent & Lundy has two large dedicated servers (each with one terabyte of RAM) for seismic analysis. Using SASSI2010, we can solve large complex SSI models in a reasonable period of time. SASSI2010 has been verified and validated (V&V) to current ASME NQA-1 requirements. The V&V of SASSI2010 has been audited by NRC staff.

DTE successfully demonstrated that the Fermi 3 site is well enveloped by the ESBWR standard plant design using site-specific seismic inputs based on the CEUS SSC model and accounting for partial embedment of the reactor building/fuel building and control building into bedrock.

Sargent & Lundy Contact: Farid Berry, Vice President and Project Director
312-269-7323

55 East Monroe Street ▪ Chicago, IL 60603-5780 USA ▪ 312-269-2000 ▪ www.sargentlundy.com