

# SEISMIC SOIL-FOUNDATION STRUCTURE INTERACTION (SFSI) ASSESSMENT



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**Seismic performance evaluation of critical structures such as ultra-tall buildings, power plants, industrial facilities, and similar, requires consideration of the site-specific soil, foundation, and superstructure interaction (SFSI) effects.**

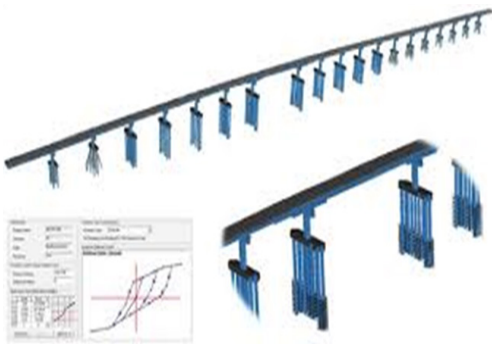
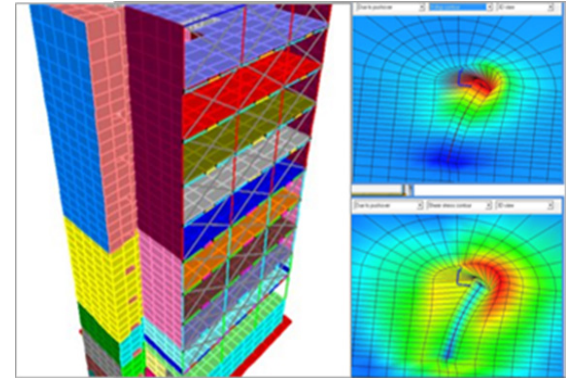
We provide quantification of SFSI effects, which is essential for seismic performance-based analysis & design of critical structures.

- Develop performance-based earthquake-resistant design.
- Develop appropriate retrofit and repair approaches.
- Enable realistic assessment of risk and reliability for decision making.
- Enable accurate estimation of near real-time response to facilitate emergency shutdown.

# Soil-Foundation-Structure Interaction (SFSI)

## SOIL-FOUNDATION-STRUCTURE INTERACTION ANALYSIS

We perform site-specific soil-foundation-structure interaction (SFSI) analysis at various levels of sophistication – ranging from 3D nonlinear simulations under seismic loads to utilization of the substructure method with kinematic interaction and foundation damping effects or employing simplified modification factors – based on the specific requirements of each project.

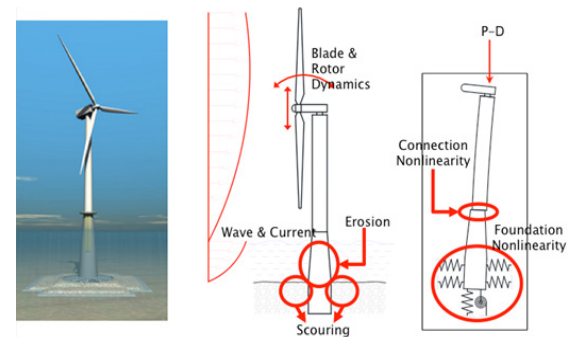


## TALL, ULTRA-TALL BUILDINGS & BRIDGES

We perform site-specific SFSI analysis and provide realistic time histories for the performance-based design of these structures. We also provide damage identification not only under earthquake loads but also for operational loads if structural health monitoring systems are implemented.

## POWER PLANTS & INDUSTRIAL FACILITIES

We develop customized solutions based on project types. For example, in the case of wind farms, we perform multi-hazard (combined wind, wave, and earthquake) analysis and risk assessment for design. We also provide information such as damage identification and remaining life prognosis if structural health monitoring systems are implemented.



## EARTHQUAKE EMERGENCY SHUT-DOWN SYSTEM

We implement earthquake monitoring systems that provide real-time response information and facilitate automatic shut-down of the critical operations and facilities upon exceedance of predetermined threshold levels.

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