



ermes

ELECTROTECHNICS AND MECHANICS OF STRUCTURES
R&D EXPERTISE AT THE SERVICE OF INDUSTRY

FIELD EXPERTISE

TESTING AND MEASUREMENTS

NUMERICAL SIMULATIONS

PROTOTYPED PRODUCT

MARKET-READY PRODUCT

PROJECT MANAGEMENT ASSISTANCE

Evaluating the seismic risk and facility resistance

YOUR STAKES

- Assess the risk of seismic induced faults in equipment
- Validate the performance of structures and equipment under seismic loading

OUR OFFER

Assessment of the seismic risk of a facility and its equipment:

- Seismic hazard through seismology
- Site effects (soil knowledge)
- The interaction between soil and structure
- The behavior and strength of the structure (concrete, backfill...)
- The foundation - equipment interaction
- Behavior and resilience of the equipment

This offer is intended for:

- Seismic risk assessment by integrating the entire analytical chain from the fault to structures and equipment
- Performance validation of structures and equipment under seismic loading

We offer you:

- Methodological advice and expert opinion on the entire seismic risk chain
- Advanced studies on the basis of numerical simulation
- Validation of models by means of laboratory or on-site tests



Vibratory pot simulating seismic loading

SECTORS OF APPLICATION

- Energy
- High-risk industries (petro chemistry)
- Cement plants
- Insurance companies

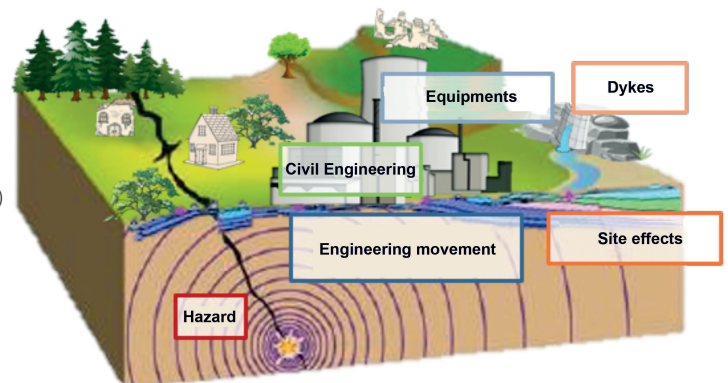


Diagram of the seismic hazard principle

Evaluating the seismic risk and facility resistance

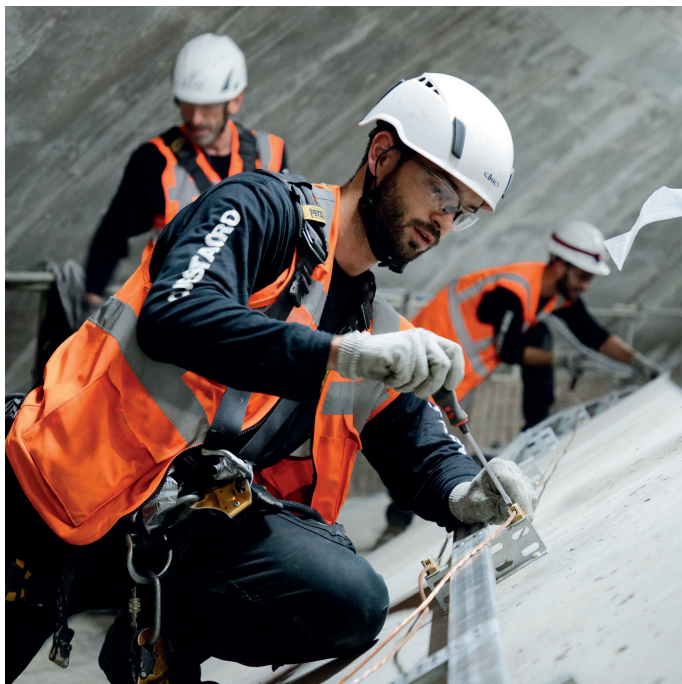
KEY FIGURES:

■ Code_Aster: 400 types of finite elements, 100 behavioral laws, complete exploitation manuals with quality assurance, multi-physics, multi-scale, parallel computing

■ EVADYN test bench: 42t concrete bedding, 4m x 4m isolated from civil engineering, with vibrating pots from 10N to 27kN, fully equipped with modern instrumentation

OUR ASSETS

- Expertise in seismology, geotechnics, civil engineering and structural dynamics.
- Numerical simulation tools for site effects, soil-structure interaction and structural behavior, based on Code_Aster (open source thermomechanical solver) hosted in Salome_Meca.
- Testing facilities to test the equipment's performance in the event of an earthquake.



Instrumentation du système de détection de séisme dans l'espace entre enceinte du bâtiment



SATISFIED CLIENTS

- EDF nuclear, thermal and hydraulic generation plants
- CEA
- AIEA

CONTACT:

retd-ermes-prestation-ext@edf.fr

A RICH HISTORY

- EDF has strong partnerships, notably with the SEISM institute (BRGM, CEA, CentraleSupélec, CNRS, EDF, ENS Paris-Saclay) and the Association Française du Génie ParaSismique (AFPS).
- EDF is working jointly with the CEA and the IAEA on methods and tools to qualify and evaluate the results of probabilistic seismic hazard models.
- EDF participates in the update of the RCC-M codification (design and construction rule for nuclear equipment).
- EDF works with design offices in connection with the management of earthquake structures (e. g. ARTELIA, EGIS, Geodynamics & Structures, INGEROP, SIXENSE Necs and TRACTEBEL).