



## Seismic Assessment

As part of structural integrity assessment capability, EASL carries out seismic assessment to demonstrate operability, integrity and/or stability of structures, systems and components (SSCs) to earthquakes. For safety-related nuclear SSCs, seismic assessment is often an essential part of nuclear safety case.

### What is Seismic Assessment?

Seismic assessment is part of a range of seismic evaluation tasks applied to SSCs at the design and operational stages of plants life. Often based on a range of design codes, seismic assessment demonstrates structural integrity and stability by taking into account many aspects of the strain and effects due to earthquakes.

Seismic assessment calculates the capacity of SSCs in accordance with appropriate design codes and standards and compare the capacity against the all loading demands. This will demonstrate the capability of the SSCs to perform their design safety functions against the defined earthquakes.

Assessment tends to be structured in two parts: design basis earthquake (DBE) assessment and seismic margin earthquake (SME) assessment. While deterministic methods are normally used for both the DBE and SME assessments, probabilistic assessment methods can also be applied in the SME assessment. Probabilistic SME assessment will produce seismic fragility of SSCs which will be required for risk-informed design or performance-informed design evaluations.

### EASL's Seismic Assessment Services

We have extensive seismic assessment expertise and experience for a wide range of SSCs for seismic design, substantiation, qualification or nuclear safety case. Supported by our comprehensive seismic analysis capabilities, the areas covered by our seismic assessment service includes:

- Seismic assessment of mechanical systems, plants, glovebox trains, mechanical handling equipment and cranes
- Seismic assessment of civil engineering structures including dockyard facilities supported on piled foundations
- Seismic qualification of pressure vessel, plant and piping systems
- Seismic margin assessment to demonstrate high confidence of low probability of failure (HCLPF)
- Probabilistic seismic margin assessment (fragility studies) to provide seismic fragility of SSCs
- Life extension, re-validation and fitness for purpose assessments
- Assessments using British, American and European design codes with particular expertise in ASME III, PD5500, ASME B31.3, BS806, BS5950, BS5400 and BS2573
- Development of seismic safety cases for new and operational nuclear installations

We keep our service at the forefront of seismic assessment technology by implementing (where necessary) the latest recommendations from the leading institutions, such as ONR (UK regulator), USNRC (US regulator), ASCE, EPRI, IEEE and ASME.

We take a pragmatic approach in selection of suitable route in seismic assessment leading to the most cost-effective solutions that will satisfy the assessment goal or safety case requirements. To satisfy challenging assessment demands, if and when necessary, we are capable of method development beyond the general practice in seismic assessment, such as automation of assessment procedure.

To find out more about our other seismic services, take a look at our related services and case studies below, or if you'd like to discuss something specific with our seismic assessment services, or get in touch on [enquiries@easl-stress.co.uk](mailto:enquiries@easl-stress.co.uk).

### Related Services

- Hazards
- Seismic Analysis of Structures
- Seismic Design