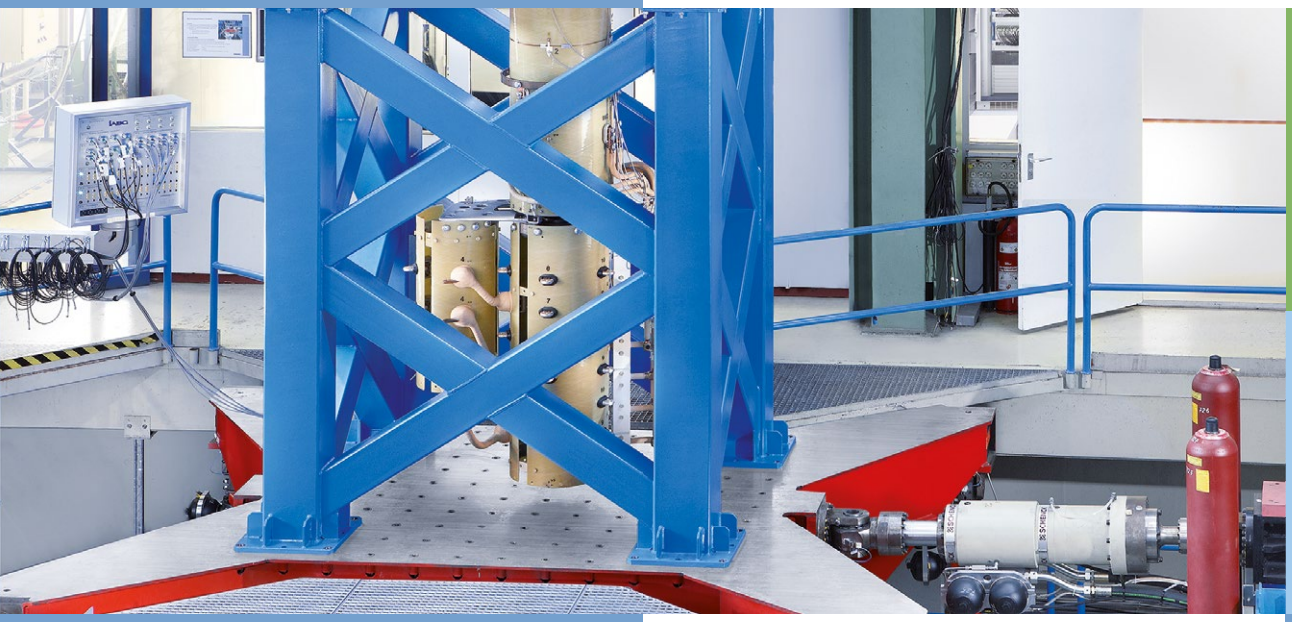
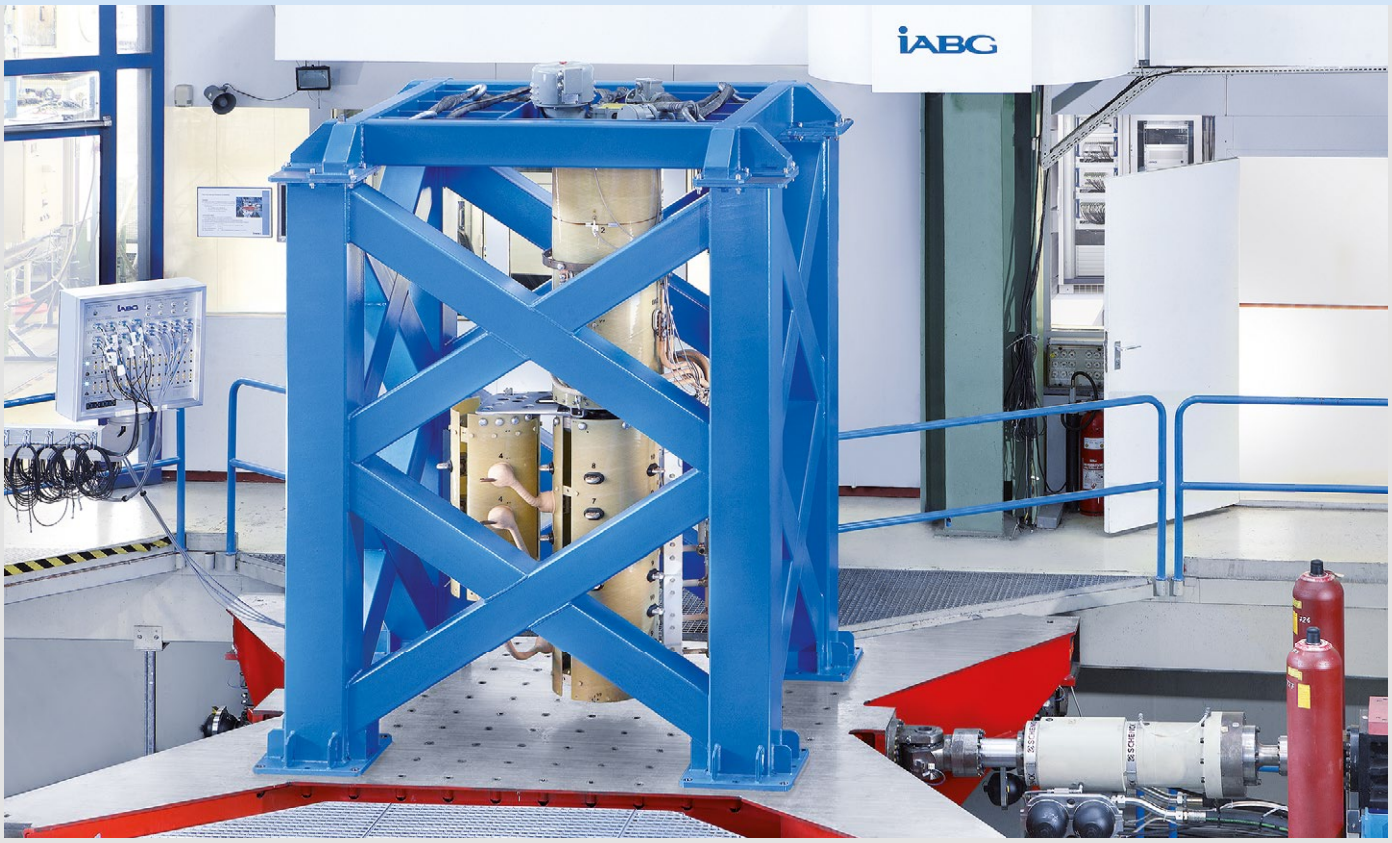
Calculation Methods



Seismic Safety

Calculating the strength of mechanical structures under seismic loads

IABG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Calculating the strength of mechanical structures under seismic loads

The security and serviceability of plants and assemblies in earthquake-prone areas requires proof of stability, integrity and reliability of devices and components under earthquake-specific loads.

IAGB assists with, advises on and supplements the selection of relevant loads, the definition of load assumptions and the experimental verifications to help accelerate the necessary development cycles and ensure that all relevant national and international requirements are fulfilled. In addition to calculation and simulation services, IAGB can simultaneously carry out a real-time strength analysis under realistic seismic conditions using an earthquake test bench supporting masses of up to 10 tonnes. This combined approach delivers significant benefits for our customers. Weaknesses such as low resonance frequencies in the test items are calculable and can be detected and corrected at an early stage, thus reducing development times. The required test rigs are defined and verified with maximum precision. During the test cycles, non-measurable loads are derived mathematically from measurable parameters. Lastly, the calculation models deployed are validated against the test requirements and adapted accordingly. These validated models are then used to verify the respective derivatives mathematically.

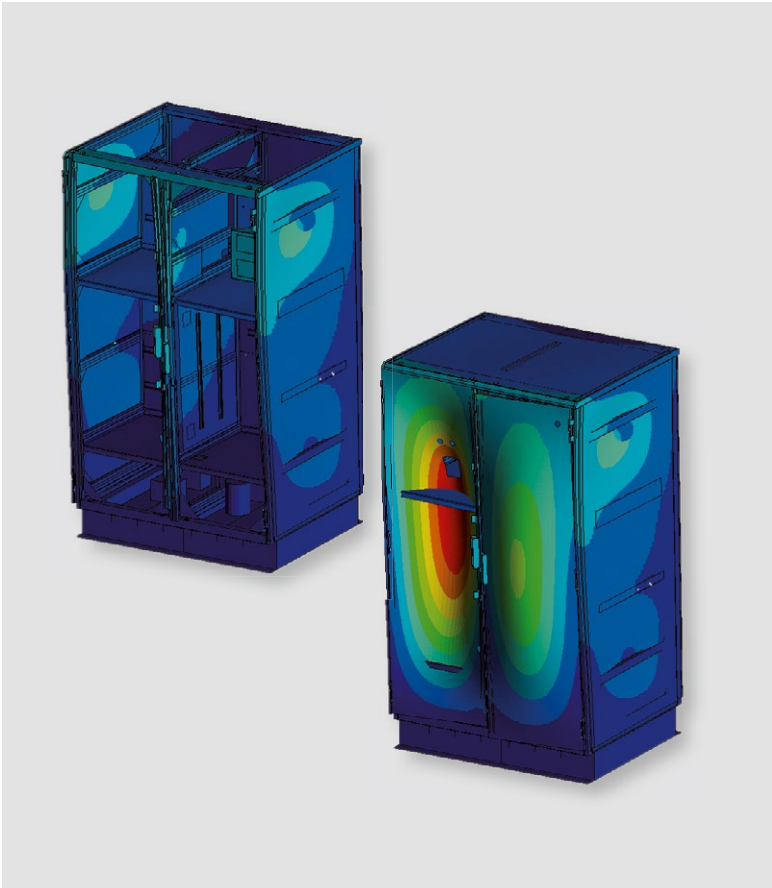
In the course of various collaborations with product manufacturers and system operators over the past few years, we have conducted more than 800 individual seismic vibration tests, many of which included accompanying mathematical calculations.

Services

- Consulting on and creation of seismic designs
- Derivation of seismic load assumptions from national and international standards (IEEE693-2005, KTA 2201.4, DIN EN 1998 -1, IEC 980, IEEE 344-2004)
- Calculated modal, frequency response, transient and (shock) response spectrum analyses
- Alignment of FE models with test data
- Fatigue strength evaluation according to standard guidelines (e.g. FKM guideline for analytical strength assessment, VDI2230, VDI2014)
- Components and systems tests

Benefits of calculated analyses

- Valuable input at an early stage in the design phase
- Component optimisation
- Complete strength evaluation or calculated evaluation as supplement to the acceptance test
- Cost-efficient comparison of the impact of different response spectra
- Early, relatively exact strength evaluation for new products by applying updated FE model properties from previous projects



AUTOMOTIVE

INFOCOM

MOBILITY, ENERGY & ENVIRONMENT

AERONAUTICS

SPACE

DEFENCE & SECURITY

About IABG

IABG offers integrated, ground-breaking solutions in the sectors Automotive • InfoCom • Mobility, Energy & Environment • Aeronautics • Space • Defence & Security. We provide independent and competent consulting. We implement with future viability and target orientation. We operate reliably and sustainably. Our success is based on an understanding of market trends and requirements, on our staff's technological excellence and a fair relationship with our customers and business partners.

We are an experienced and competent development partner. We provide numerous technical qualification tasks and offer solutions in the sectors of reliability, quality, construction and materials.

Our comprehensive service portfolio includes everything from the numerical and experimental analysis, all the way to the implementation and operation of customised, turn-key test facilities.

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