

Mechanical and Vibration Testing

Separate Fluid-Dynamic and Mechanical Tests for Nuclear Power Plants

Optimization of power plant components through reliable and comprehensive testing

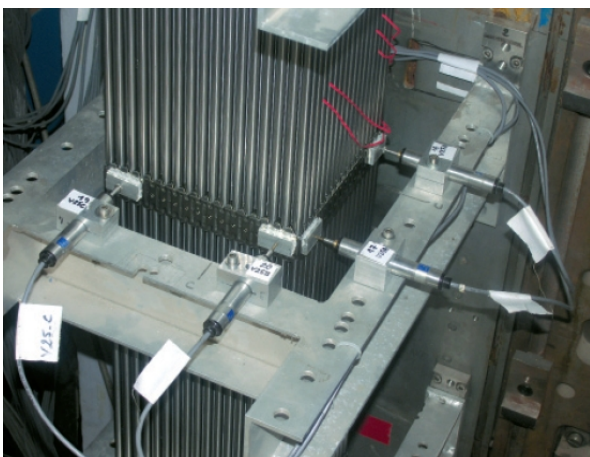
Challenge

In nuclear power plants, complex plant systems and individual components must be capable of performing their designated functions at all times during normal operation as well as under any postulated accident condition. Carefully designing and simulating the mechanical component response is possible using finite element (FE) methods. However, the resulting models have to be validated.

Solution

We help customers to validate codes, models and designs with our mechanical and vibration tests on full-scale component prototypes. We provide the following results :

- Validation of the FE models and component simulations
- Data about connections behavior between the parts of a component



Fuel assembly instrumented with strain gages and displacement sensors on CALVA test bench



SOPHIE bench: vibration of steam generator tubes

Customer benefits

- Reliable test results through well-equipped laboratories using sophisticated measurement systems
- Accredited test laboratories according to ISO 17025 for highest test quality
- Wide range of application such as for nuclear and renewable energy projects
- Extended analysis possibilities with access to our world wide thermal hydraulic platform

Your performance

is **our** everyday **commitment**

Technical information

Test parameters

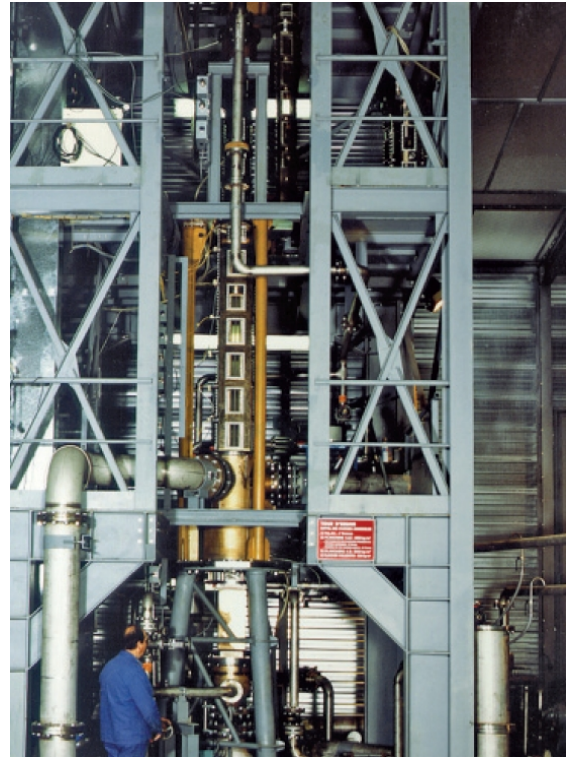
- Flow rate up to 1,000 m³/h
- Shaking devices with forces up to 2,000 N
- Temperature up to 100°C
- Pressure up to 16 bar

Measurements and instrumentation

- Temperature, pressure, flow rate
- Accelerometer
- Displacement (laser vibrometer, eddy current sensors, strain gauges, displacement sensors)

Data acquisition

- Powerful data acquisition and process control systems



MAGALY bench: flow-induced vibration testing of control rod guide and control rod cluster assemblies

Key figures

- More than thirty years experience in testing and analyses
- Comprehensive testing infrastructure

References

CALVA Bench

- Mechanical characterization of EPR control rod guide assembly (CRGA)
- EPR CRGA vibration fatigue test
- EPR CRGA loss-of-function test
- Mechanical characterization and modal analysis of 14-ft fuel assembly

MAGALY Bench

- Flow-induced vibration testing of control rod cluster assembly for EPR reactor and 1,300 MWe French plants

SOPHIE Bench

- Vibration behavior assessment of steam generator tubes

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