**Reactor Steam Generator Component Testing**

**Design Validation and Life Time Assessment of Steam Generator Elements**

Comprehensive testing and competencies to support the hydraulic and mechanical design validation and the life time justification of reactor steam generator’s components.

**The challenge**

In nuclear power plants, steam generator (SG) and SG components must withstand solicitations like hydraulic forces, flow induced vibrations, fretting and wear in normal operation, dynamic loads and displacements during abnormal situations like earthquake or LOCA.

We propose a wide variety of test facilities and competencies applied to hydraulics, mechanics or vibrations and wear. Tests are related to design qualification, mechanical properties characterization and life time justification and provide input data for hydraulic and mechanical calculations.

**Test facilities**

**SG dryer drains mock-up**

- Reduced scale mock-up of SG dryers and drains
- Air & simulating fluid (instead hot steam & water)

**SG dryer drains mock-up**

**Maximum flow rate in drain per stage of dryer**

**AUREO test bench**

- Sliding, impact, impact-sliding, fretting
- Force up to 240 N
- Steam environment, up to 320 °C and up to 154 bar
  - Wear on steam generator tubes and anti vibration bars

**SOPHIE test bench**

- Mechanical and vibration tests on SG tubes and repaired SG tubes in air
- SG tube vibration modes, wear of SG tube/stabilization devices, assessment of tube-tube and tube-support plate junctions

**SG support plate compression test bench**

- Quasi static compression test of a full scale half support plate

**SG support plate compression test bench**

Support plate and local cells deformation vs load

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*SG dryer drains mock-up*

*SG support plate compression test bench: deformation of SG support plate and cells under continuous compression load*
Reactor Steam Generator Component Testing

Our scope of services

- Characterisation of wear mechanisms
- Unique skills and knowledge to design, manufacture and operate test facilities in hydraulics and mechanics
- Vibration modes and mechanical characteristics measured on full scale SG tubes
- Unique Aurore to measure wear between SG tube and Anti Vibration Bar
- Instrumentation of each apparatus (force, displacement, pressure, temperature, vibrations)
- Development of specific software to pilot benches and to perform data acquisition
- Signa and datal processing (friction coefficient, wear rate, ...)

Sophie test bench: Vibrations of steam generator tubes

Professional consulting and services in hydraulics, mechanics and vibrations in a single skilled team

Your Benefits at a Glance

- Well equipped laboratory with sophisticated benches and measurement systems
- More than twenty years of experience and analysis
- Short reaction times even for complex tasks
- Readily available laboratory infrastructure in associated disciplines
- Hydraulic, mechanical and vibratory skills from one single source

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