

Qualification of Components

Infrastructure supporting full-scale thermal-hydraulic tests

Powerful and flexible infrastructure to supply full-scale test facilities with energy and high pressure steam

Challenge

Large test facilities require a remarkable amount of steam and electrical energy. An adequate infrastructure must be able to supply this energy flexibly and reliably. The infrastructure must not only supply this energy, but also remove the energy from the systems. A central water supply of treated and demineralized water is a prerequisite for operating such loops.

Solution

In its component qualification facility in Karlstein, Germany, Framatome operates an infrastructure that can supply various full-scale test loops with the required energy, steam and fluids, all at the required properties.

- High-pressure steam-supply Benson boiler generates steam used for performing valve tests and LOCA qualification of safety-related components and for supporting passive safety system development.
- The 20 MW DC power supply directly connects to the German grid and is used to perform critical heat flux tests using electrically heated fuel assemblies for PWRs and BWRs.
- Two heat removal systems (high and low pressure)
- Water treatment plant supplies demineralized water from two independent parallel lines



New transformer for 20 MW grid connection



25 MW high pressure heat removal system



Arrival of the new Benson boiler

Technical information

- Benson boiler steam supply: 520 °C, 187 bar, 25 t/h
- Electrical DC power supply: 20 MW, 83 kA
- High pressure heat removal system: 25 MW, 25 bar
- Low pressure heat removal system: 8 MW, 80 °C
- Water treatment and demineralization plant: 2 x 6 m³/h, < 0.2 µS/cm

Customer benefits

- Combination of powerful and flexible infrastructure and full-scale test facilities
- Reliable test results through accreditation as test and inspection body in accordance with ISO 17025 and 17020, accepted by ILAC

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is our everyday **commitment**

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