

➡ **Large Valve Test Facility GAP**

➡ Thermal-hydraulics

➡ Data recording

Large Valve Test Facility GAP of TGT3 in the Technical Center Karlstein

Large Valve Test Facility GAP



Technical Center - TGT3 Components Qualification Karlstein

Präsentationen NRC 24.06.2003 GAP General Description

Large Valve Test Facility GAP of TGT3 in the Technical Center Karlstein

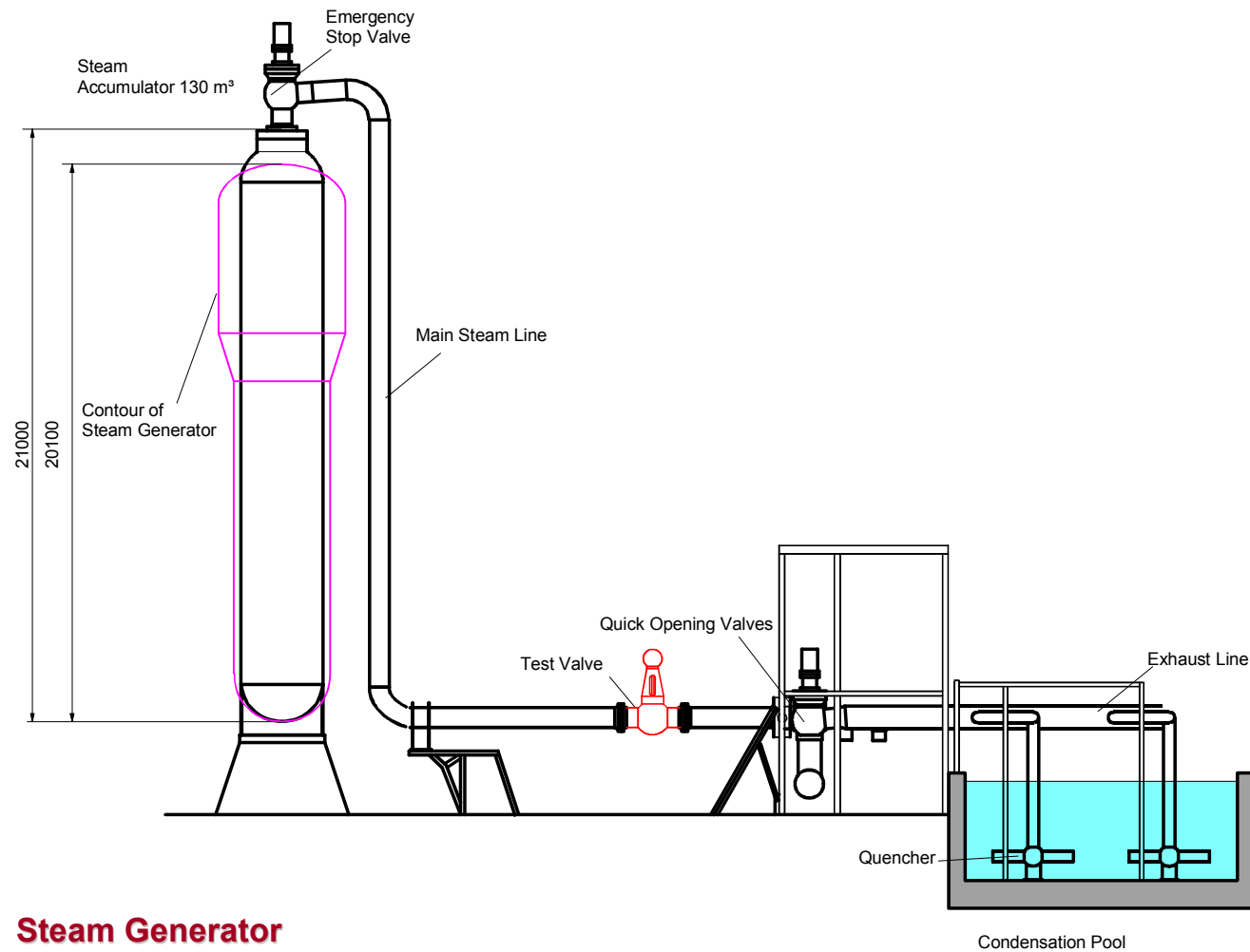
- The Large Valve Test Facility GAP originally was designed as a full-scale model of part of a 1300 MW-PWR secondary circuit.
- It is used for other test conditions where high mass flows of steam and hot water are required.
- 22 MW steam power station at pressure up to 165 bar at 500 °C
- 125 m³ high-pressure steam accumulator
- Like the steam generators installed in the nuclear power plant, the GAP test stand also has a flow limiter at the outlet of the accumulator
- The emergency stop valve plus a safety valve and a relief valve at the top
- 38 m-long 28"-diameter main steam line
- The test stand is designed to simulate a full-size pipe break scenario. For this it is fitted with two quick-opening valves with an opening time of about 0.2 seconds.
- 970 m³ pool of water in which the steam is condensed

Basic Equipment

Technical Center - TGT3 Components Qualification Karlstein

Präsentationen NRC 24.06.2003 GAP General Description

Large Valve Test Facility GAP of TGT3 in the Technical Center Karlstein

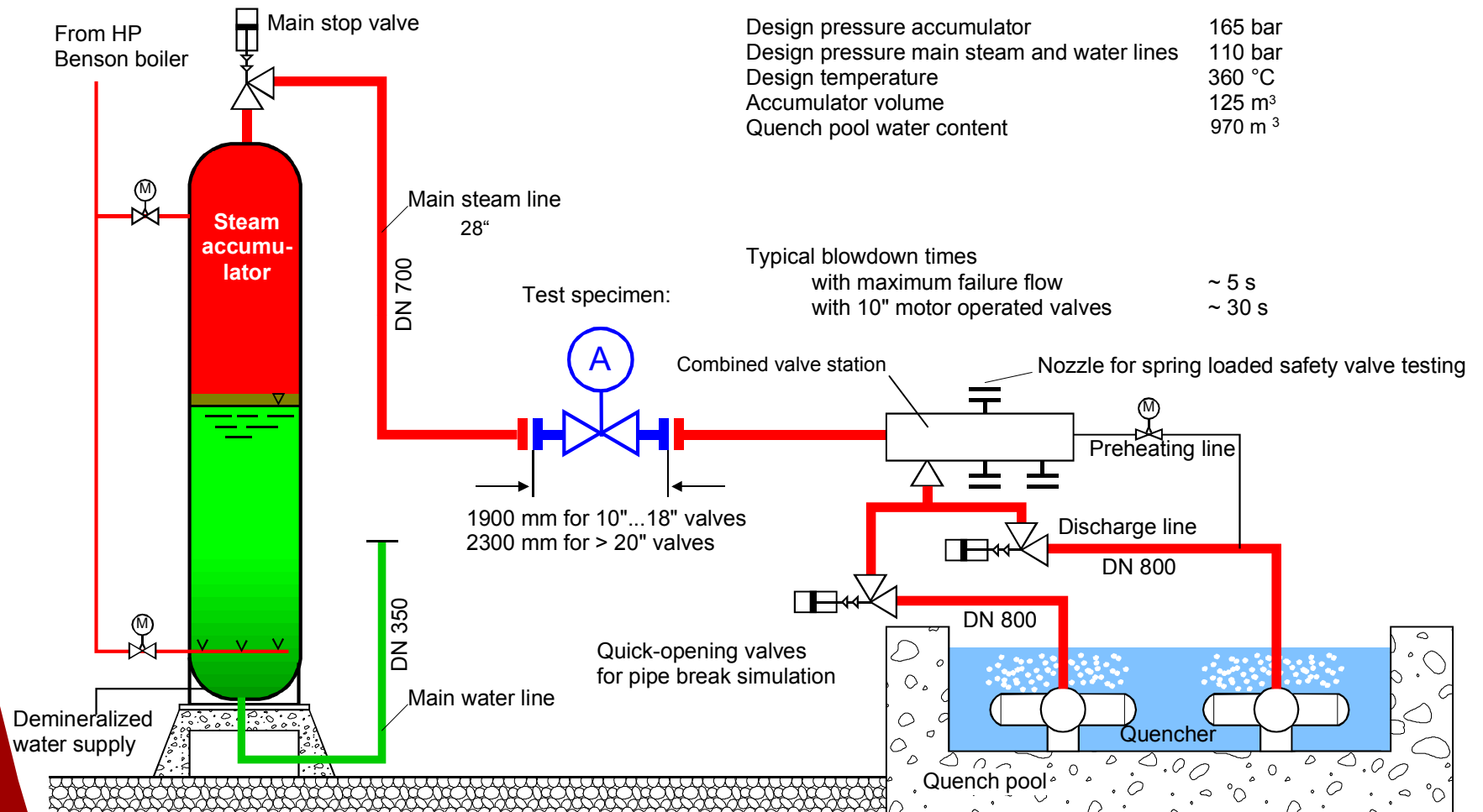


Steam Generator

Technical Center - TGT3 Components Qualification Karlstein

Präsentationen NRC 24.06.2003 GAP General Description

Large Valve Test Facility GAP of TGT3 in the Technical Center Karlstein



Test Setup for Steam and Twophase Flow Blow-down Tests for Test Valves > 10"

Technical Center - TGT3 Components Qualification Karlstein

Additional test equipment allows to test also valves up to 8" with water of high mass flow conditions for subcooled and saturated water up to 110 bar. For that reason the bottom of the accumulator is connected to the test bed.



Large Valve Test Facility GAP of TGT3 in the Technical Center Karlstein

Select Test Examples of Isolation Valves



Santa Maria di Garona



Internals of Main Steam
Isolation Globe Valve
of Convoys Plants

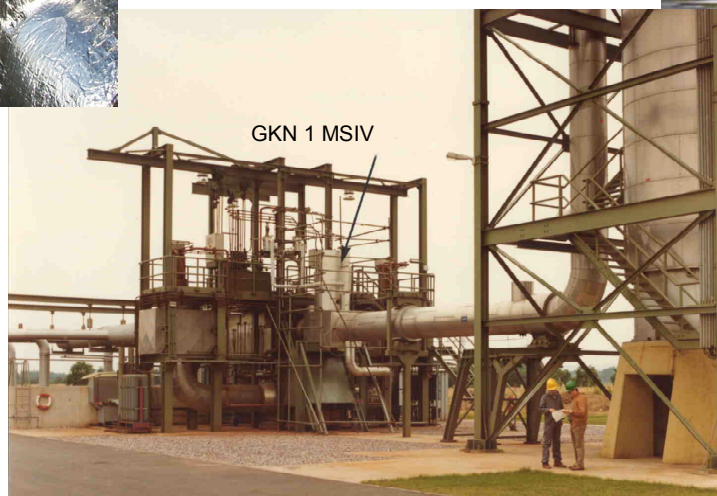


Sizewell B



Youngwang 3 to 6
Ulchin 5 & 6

Feedwater Isolation Valve DN 200



GKN 1 MSIV



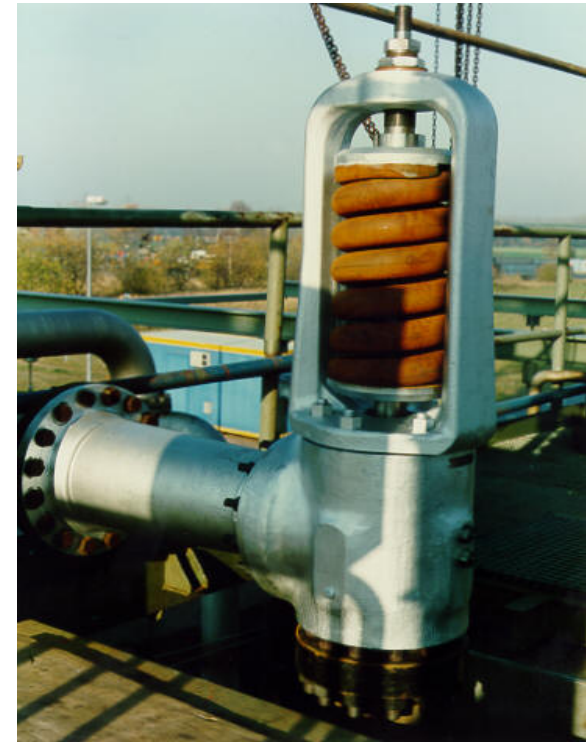
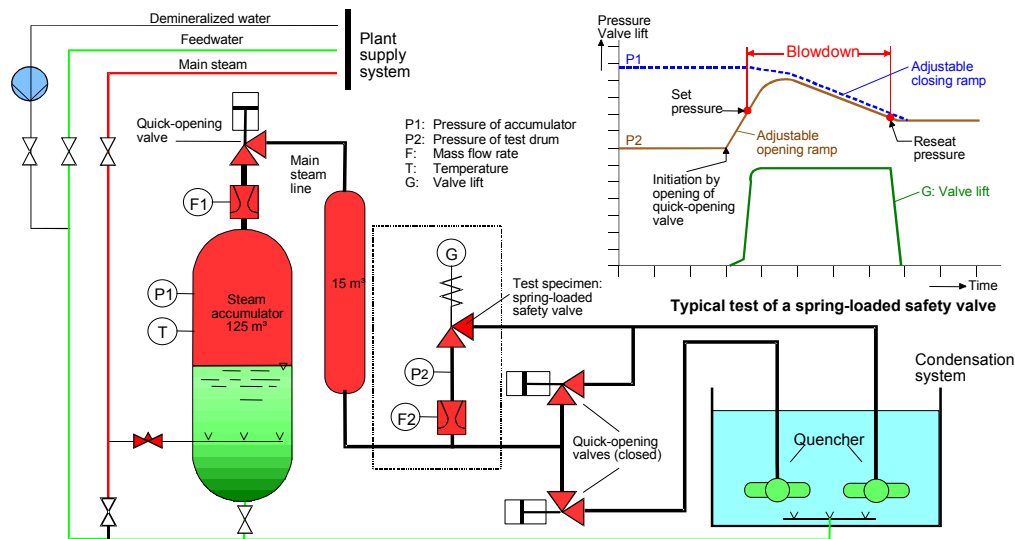
28" Main Steam Isolation Gate Valves

Technical Center - TGT3 Components Qualification Karlstein

Präsentationen NRC 24.06.2003 GAP General Description

Large Valve Test Facility GAP of TGT3 in the Technical Center Karlstein

Main Steam Safety Valves (MSSV) must be actuated under a positive pressure ramp, where the pressure increases during the opening of the safety valve. With the Large Valve Test Facility those tests are possible even for bigger safety valves up to 10”.



Qualification of MSSV for Sizewell B

Functional Tests of Spring-Loaded Main Steam Safety Valves DN 150...250 (6"...10")

Technical Center - TGT3 Components Qualification Karlstein

Large Valve Test Facility GAP of TGT3 in the Technical Center Karlstein



Fragmentation of Insulation Material by Steam and Two-phase Flow Jets during LOCA

Technical Center - TGT3 Components Qualification Karlstein

Präsentationen NRC 24.06.2003 GAP General Description

Large Valve Test Facility GAP of TGT3 in the Technical Center Karlstein



Fragmentation of Insulation Material by Steam and Two-phase Flow Jets during LOCA

Technical Center - TGT3 Components Qualification Karlstein

Präsentationen NRC 24.06.2003 GAP General Description

Large Valve Test Facility GAP of TGT3 in the Technical Center Karlstein



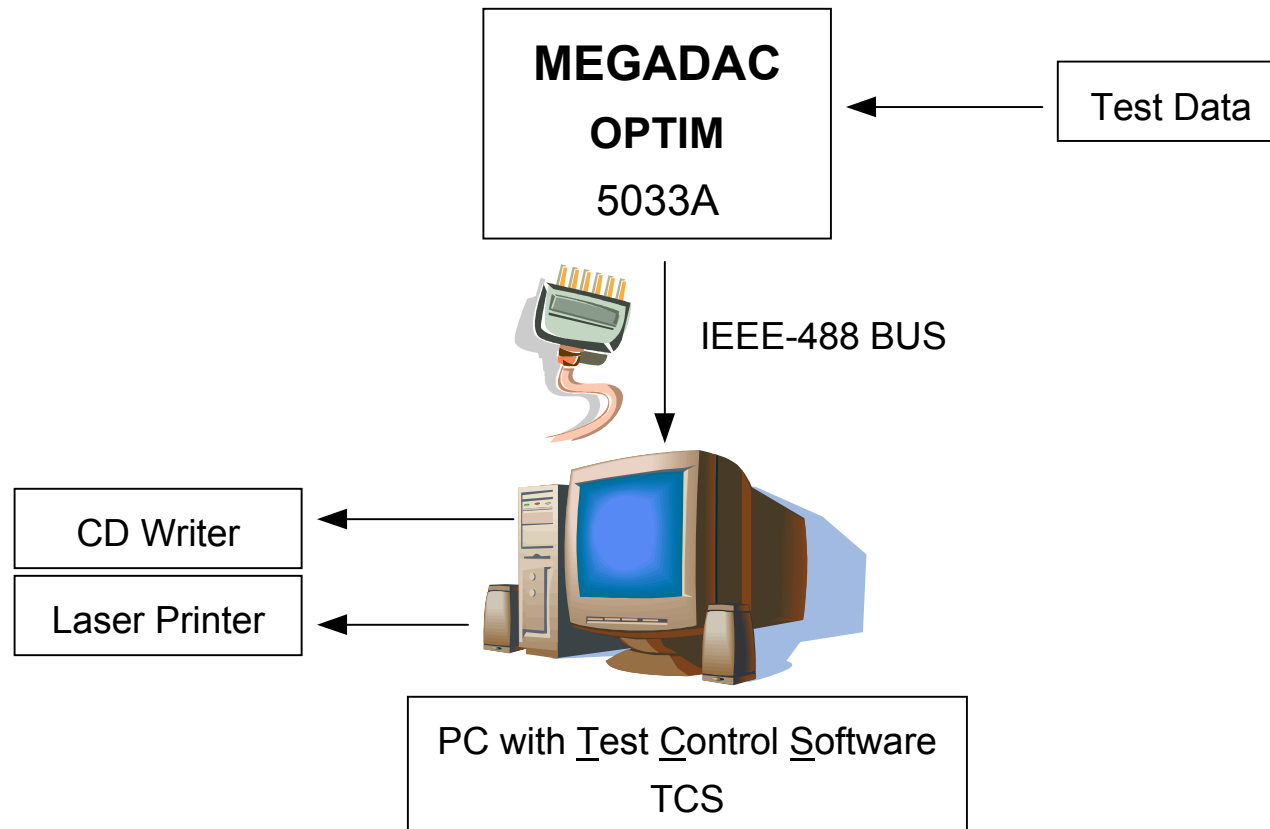
Video of a Blow-down

Technical Center - TGT3 Components Qualification Karlstein

Präsentationen NRC 24.06.2003 GAP General Description

Large Valve Test Facility GAP of TGT3 in the Technical Center Karlstein

- The data will be collected on a high performance PC based data acquisition system MEGADAC. The maximum sample rate is 200000 samples/s.



Data recording – Data Acquisition System

Technical Center - TGT3 Components Qualification Karlstein

Präsentationen NRC 24.06.2003 GAP General Description

Large Valve Test Facility GAP of TGT3 in the Technical Center Karlstein

- The **MEGADAC** has plug-in modules so that the requirements of the measurement can be met:

- **8 Channels (AD 5884 TD)**

directly to thermocouples

4-pole Butterworth filter. The filter frequency is 40 Hz.

- **16 Channels (AD 885 SH)**

of sample and hold differential inputs

3-pole 310 Hz Bessel filter

(for differential pressure, valve lift, ± 10 V signal)

- **22 Channels (AD 682 SH1)**

of sample and hold differential inputs with on-board signal excitation and programmable gains

8-pole Butterworth filter, the frequency is computer controlled up to 20 Hz – 10 kHz

(for pressure and force sensors with strain gauges)

Data recording – Plug-In Modules

Technical Center - TGT3 Components Qualification Karlstein

Präsentationen NRC 24.06.2003 GAP General Description

Large Valve Test Facility GAP of TGT3 in the Technical Center Karlstein

- Quick look evaluation is released after each testing
(checked and signed)
- The test records are converted into ASCII-format and stored on a compact disk

Data recording

Technical Center - TGT3 Components Qualification Karlstein

Präsentationen NRC 24.06.2003 GAP General Description

Large Valve Test Facility GAP of TGT3 in the Technical Center Karlstein

? ? Questions ?

