

Angra, Unit 2

Nuclear Power Plant



Angra dos Reis, Brazil

With a total output of 1,350 MW, Brazil's largest nuclear power station, supplies power to the megalopolis of Rio de Janeiro and Sao Paulo.

Operator:

ELETRONUCLEAR - Eletrobrás
Termonuclear S.A.

Customer:

AREVA NP

Application:

1,350 MW Pressurized water reactor
(PWR)

Commissioned:

1999

Low Life cycle costs but highest degree of availability

As a globally certified full liner with a comprehensive know-how, we contracted to supply perfectly matched components and were thus able to provide the customer with the highest degree of availability of his installation as well as low life cycle costs (LCC). Numerous KSB pumps and valves are used to cope with a wide variety of duties. For example, there are RHR pumps installed in the intermediate cooling, fuel pool cooling and residual heat removal circuits, RER reactor coolant pumps and RHG safety injection pumps. In addition to the pumps, there are upwards of 5000 KSB valves installed in the low, medium and high pressure areas (LP, MP and HP) as specified by the customer. Since 1999, the valves already employed are being augmented by relevant new additions in accordance with the latest technological developments. Through routine inspections, sensible optimizations and parts replacements, our service engineers secure and maintain the highest possible level of safety. All pumps and valves are subjected to regular trials and test runs, the results of which are carefully documented. As part of the supply contract, KSB also supervised the commissioning of the plant, provided the customer's operators with on-the-job training and monitored their every-day running of the plant. Since 2008 KSB has its own office on-site.





Angra, Unit 2 – Scope of supply and project details

Pumps:



- 6 x intermediate cooling circuit pump RHR
- 3 x fuel pool cooling pump RHR
- 4 x residual heat removal pump RHR
- 4 x reactor coolant pump RER
- 3 x feed pumps RHD and MBH
- 3 x condensate pump WKV
- 2 x start-up and shut-down pump HBRK
- 4 x safety injection pump RHG
- 4 x emergency feed pump RHG
- 3 x high-pressure safety injection pump RVM
- 4 x moisture separator condensate pump HPK




Valves:

- Diaphragm valves, DN 15 – DN 150
- NUCA valves, DN 10 – DN 50
- Gate valves, DN 80 – DN 200

- 2-way valves, DN 50 – DN 400
- Dampened non-return valves, DN 450 – DN 550
- Bellows-type valves, DN 80 – DN 450
- Swing check valves, DN 80 – DN 400

More than 5000 valves are giving reliable service in the high, medium and low pressure (HP, MP and LP) areas

| RHD/MBH feed pump | RER reactor coolant pump | WKV condensate pump | RVM high-pressure safety injection pump |
|--|--|--|--|
| Temperature: 200 °C Pressure: 100 bar Capacity: 1,130 kg/s at 150 °C Head: 55 m | Temperature: 350 °C Pressure: 175 bar Capacity: 22,730 m ³ /h at 293 °C Head: 90 m |  Temperature: 85 °C Pressure: 34 bar Capacity: 730 kg/s at 40 °C Head: 14 m |  Temperature: 100 °C Pressure: 250 bar Capacity: 15 kg/s at 65 °C Head: 1,100 m |

| ZTN gate valve | MXN diaphragm valve | NUCA A320 stop valve |
|---|--|---|
|  Temperature: 362 °C Pressure: 210 bar DN: 65-600 |  Temperature: 100 °C Pressure: 12 bar DN: 15-200 |  Temperature: 362 °C Pressure: 210 bar DN: 10-50 |

Should you need more information, please do not hesitate to contact us:

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