

Facts and figures on Leibstadt Nuclear Power Plant

Owners of Kernkraftwerk Leibstadt AG

AEW Energie AG	5,4 %
Alpiq AG	27,4 %
Alpiq Suisse SA	5 %
Axpo Power AG	22,8 %
Axpo Trading AG	16,3 %
BKW Energie AG	9,5 %
Centralschweizerische Kraftwerke AG (CKW)	13,6 %

Plant Manager	Dr. Andreas Pfeiffer
Executive Board	Axpo Power AG on behalf of partners
Chairman	Dr. Stephan Werner Döhler, Head of Nuclear Energy Division, Axpo Power AG

Supervisory Board

Andy Heiz, Chairman
Michael Wider, Vice-Chairman
Thomas Bucher
Dr. Guy Bühler
Esther Denzler
Dr. Stephan Werner Döhler
Michael Dost
Hermann Ineichen
Dr. Michaël Plaschy
Kurt Schmid

Major employer

Number of employees at the end of 2015: 533 staff in 519.5 full-time jobs, 17 trainees (7 automation specialists; 4 polymechanics, 2 office staff, 1 specialist in operational maintenance, 1 logistics specialist, 2 computer specialists).

Origin of the employees: 40% from the neighbouring region, 25% from the State/County of Aargau, 10% from other regions of Switzerland, 25% from adjacent foreign countries.

Reliable production

Project and construction period: 1964 – 1984

Start of commercial operation: 15 December, 1984
So far Switzerland's newest and most powerful nuclear power plant

Annual production 2015: 8599 GWh; amounts to 14 % of Swiss power consumption / covers the power requirements of over one million people.

Low production costs (2015)

Construction costs: 4.8 billion francs

Production costs: 5.99 Rp/kWh

Composition: 38% Operations; 9% Nuclear Fuels; 23% Spent Fuel Storage; 7% Decommissioning; 13% Depreciation Tangible Assets; 10% Financial Success and Profits.

Real climate protection

Greenhouse gases: Electric Power is produced in KKL without greenhouse gases. Through the entire nuclear chain, 6 – 8 g of CO₂ equivalents are produced per generated kWh of power (in comparison: coal approx. 912 g/kWh; gas-fired combined cycle power plant 426 g/kWh; photovoltaics 62 g/kWh (Source: PSI 2008).

Radioactive emissions into the air and water: In all years of operations, all values clearly below the maximum permissible values laid down in the operating license.

Yearly dose for persons in the immediate vicinity of Leibstadt Plant: less than 1 % of normal background radiation (terrestrial and cosmic). No increased radioactivity levels can be measured in Leibstadt. The latest values measured can be accessed anytime at www.naz.ch.

Powerful fuel

Uranium dioxide UO₂; enrichment approx. 4.25 %; average annual consumption in 128 fuel assemblies of 26 t enriched uranium dioxide; corresponds to the loading volume of a small van.

Little waste

Highly radioactive waste per year: approx. 128 fuel assemblies; corresponds to 12 m³ (excluding packaging).

Low and medium-level radioactive waste per year: 30 m³

Spent fuel assemblies: 3479 in 27 years of operation; amounts to roughly 310 m³ or a cube with a side length of 6.8 m.

Attractive information center

Number of visitors in 2015: 15.655 – one third from abroad; just over one third students, of whom 41 % are from Germany.

Power plant data

Reactor type BWR/6 from General Electric

Thermal output of the reactor	3600 MWth
Gross rated electrical output	1275 MW
Total house load	55 MW
Net rated electrical output	1220 MW

Reactor

Nominal coolant flow in the core	11 151 kg/s
Number of coolant pumps	2
Operating pressure in the reactor	73.1 bar
Reactor inlet	
– Feed water temperature	222 °C
Reactor outlet	
– Main steam temperature	286 °C
– Main steam pressure	73.1 bar
– Steam quantity	1990 kg/s
– Steam moisture content	< 0.1%

Core dimensions and fuel assemblies

Active core height (cold)	3810 mm
Total weight of uranium in core	approx. 115 t
Mean power density	62.8 kW/dm ³
Mean spec. core power	approx. 31 kW/kgU
Mean surface power density	approx. 52 W/cm ²
Fuel assemblies	
– Number	648
– Total length	approx. 4470 mm
– Weight	approx. 292 kg
– Type Optima2 (Westinghouse)	
– Type Atrium 10XM (Areva)	
– Mean enrichment	approx. 4.2 % U-235
– Mean discharge burn-up	approx. 53 MWd/kg U
– Mean time in the core	4–6 years
– Average Uranium content	approx. 180 kg
Fuel rods	
– Pellet diameter	approx. 8.5 mm
– Cladding tube wall thickness	approx. 0.6 mm
– Cladding tube diameter	approx. 9.8 mm
– Cladding tube material: Zircaloy-2	

Reactor Water Recirculation pumps (2 loops)

Nominal throughput (per pump)	1800 kg/s
Nominal delivery pump pressure	16 bar
Revolutions	1490/373/min
Power at coupling (operating temperature)	4.4 MW

Water separator and intermediate reheater

Inlet pressure	11.3 bar
Outlet pressure	11.0 bar
Outlet temperature	263 °C
Residual moisture	overheated

Turbines

Steam quantity	1810 kg/s
Steam pressure at HP turbine inlet	64 bar
Steam temperature at HP turbine inlet	280 °C
Revolutions	3000/min
Number of HP housings / flow paths	1/2
Number of LP housings / flow paths	3/6
Outer diameter of the last LP stage	3800 mm
Blade length of the last LP stage	1050 mm
Number of steam extractors	6
Condenser vacuum	0.13 bar

Generator

Rated apparent power	1318 MVA
Terminal voltage	27 kV
Cooling: stator / rotor	H ₂ O/H ₂
Excitation system	static self-excitation

Cooling water system

Main cooling water flow rate	~33 000 kg/s
Number of main cooling water pumps	4
Flow rate per pump	8250 kg/s
Pump operating head	19 mWS

Cooling tower

Type: natural draft, wet	
Main dimensions	Height 144 m, max. Ø 119.2 m
Cooling range	17.4 °C
Evaporation losses (average)	720 kg/s

Reactor building / reactor containment

Primary containment:	free-standing steel container
Secondary containment:	detached concrete building, height 58.6 m

Construction

Construction vol. (excl. cooling tower)	666 500 m ³
Materials used:	
– Concrete	200 000 m ³
– Cement	63 500 t
– Reinforcing steel	28 500 t

(1 bar = 10⁵ N/m²)

(Last updated: June 2016)