



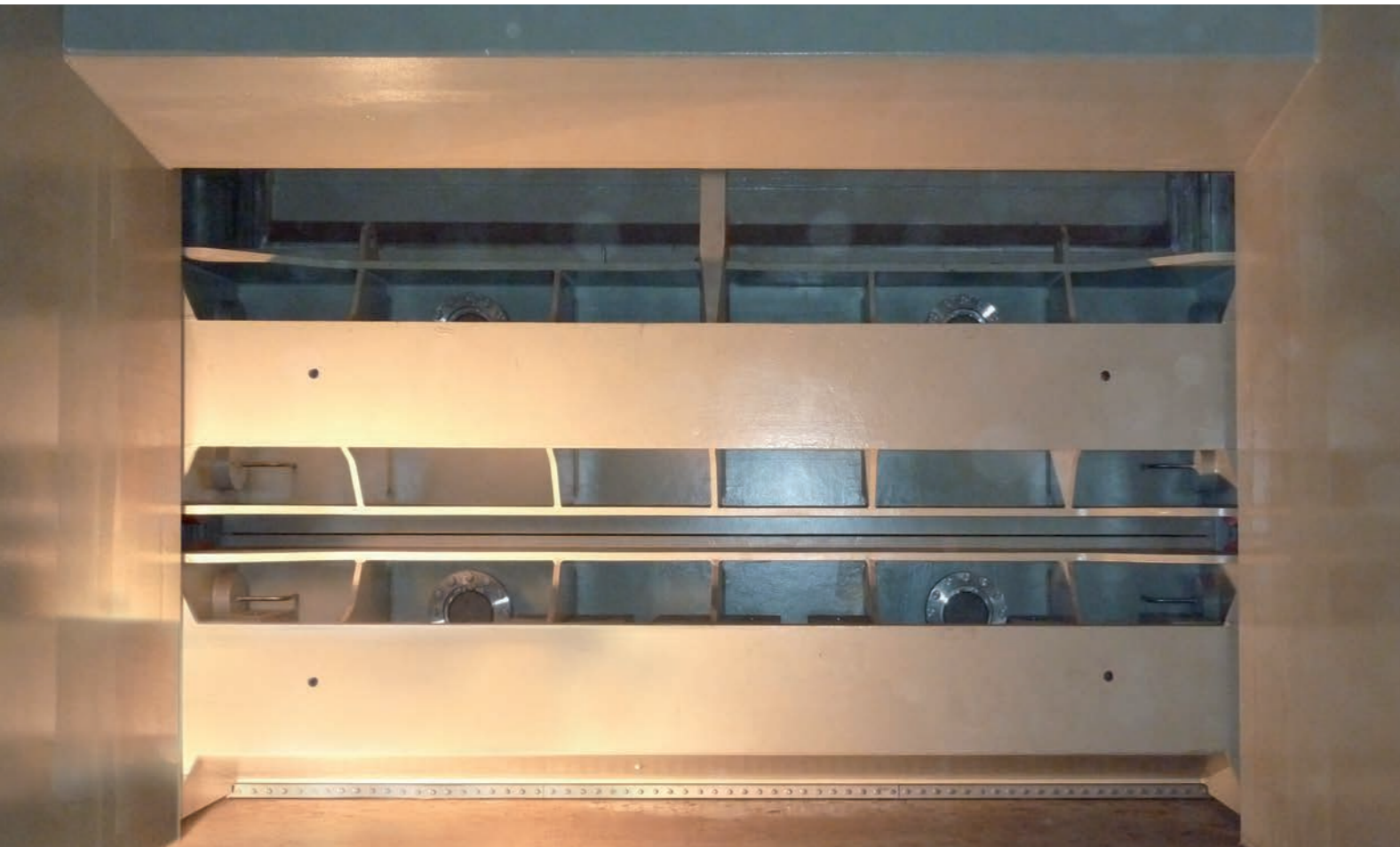
# Limberg II, Austria

*Hydro Steel Structures*

**künz**

At Europe's largest hydropower construction site, Limberg II, Kuenz realized a technical challenge in a high alpine area with proven Kuenz quality.

## Limberg II – A high alpine challenge.



Draft tube gate Limberg II



Assembling draft tube gate

### Hydraulic Steel Structures with highest precision

The Austrian Verbund Hydro Power AG assigned Kuenz for the assembling of the hydromechanical equipment at Limberg II pumped storage power plant in Kaprun, near Salzburg. The scope of supply for Limberg II was two draft tube gates which function as closure devices for the pump turbine, as well as a sliding gate for the chamber that serves as emergency shutdown. The gates are predominantly used as inspection gates for maintenance of the pump turbines. At full load a force of almost 6500 kN acts on the gates, therefore maximum precision and minimum tolerances were required for dimensioning, engineering and manufacturing.

Another challenge was the enormous water pressure of more than 284 psi on the sliding chamber gate of more than 200 m WH.

Kuenz's engineers met this challenge with the development of an innovative sealing system with a special construction for the gate's edge. With this design, the water pressure aids the closing force in such a manner that the closing is secured without any external energy or additional ballast. Therefore, the seals are replaceable without disassembling the 100 t gate and are totally accessible for service.

Another innovation is the design of the hydraulic cylinder with an implemented locking mechanism for the highest position of the gate. Pulling the bar of that locking mechanism can alone be accomplished through the hydraulic pressure caused by the gravity of the gate and thereby also without external energy sources.

### High alpine challenge for assembly and logistics

Limberg II presented the Kuenz team with another challenge due to the elevation of the construction site and the associated long access road to the several installation locations. It was also important to carefully coordinate the construction site logistics with other site activities and contractors.

In particular, the narrow conditions in the cavern were a challenge to the field engineers. During the winter time assembly, safe trails with cableways and tunnel caverns inside the mountains were used due to the avalanche danger. While assembling the rack near the „Mooserboden“ reservoir, Kuenz's field engineer's had to be educated in the use of avalanche transceivers.

### Technical data Limberg II project

#### Data draft tube gate:

Fixed wheel gates	2
Clear width	5 m
Clear height	2.8 m
Hoisting capacity	1080 kN
Design pressure	182 m WH

#### Data sliding chamber gate:

Fixed wheel gates	1
Clear width	5 m
Clear height	2.8 m
Hoisting capacity	1460 kN
Design pressure	150 m Ws

#### Data intake/outlet rack

Number of intakes	6
Clear width	7,5 m
Clear height	6 m
Rack inclination	90°
Bar distance	90 mm
Max. pressure on bars (both flow directions)	5 m Ws

Paul Stering, Verbund Hydro Power AG

*„Also for the Limberg II project, Verbund Hydro Power AG trusts Kuenz, its innovative long term partner. The extensive work processes while assembling in the narrow tunnel and caverns, as well as the difficult weather conditions in the high mountains, required accurate planning and a maximum of flexibility for construction. The completed facilities have met the operational and static load tests successfully.“*



# Technical information on the Pumped Storage Power Plant Limberg II



Limberg II serves as a load balancing power plant to provide power generation during periods of peak electrical demand. Prevalis, the former power plant, pumps water from the „Wasserfallboden“ reservoir to the 364 meter higher „Mooserboden“ reservoir where it is stored until it is required again for power generation.

The turbine output of the Kaprun pumped storage power plant doubles without further water demand to 833 MW. The power consumption increases from 130 MW to 610 MW during pumping operation.

The Limberg II pumped storage power plant is built completely underground in caverns.

## Technical Data power plant

Average height of gross head	365 m
Number of units	2
Max. turbine output	2 x 240 MW
Max. pumping output	2 x 240 MW

Further information: [www.kuenz.com](http://www.kuenz.com)



Künz GmbH  
6971 Hard  
Österreich / Austria  
[sales@kuenz.com](mailto:sales@kuenz.com)  
[www.kuenz.com](http://www.kuenz.com)