

Peak Demand Supply – Environment-friendly Pump Storage Power Plant KOPS II, Austria

Successful implementation of control technology at the pump storage power plant in KOPS II, Austria



Background

The KOPS II Hydropower project is located inside the Alps, drawing from the same reservoir as the KOPS I hydropower station, commissioned in 1969. The stations are supplied by the Rifa balancing reservoir, located between the tourist centers of Gaschurn and Partenen. The KOPS II pump station and headrace tunnel was built to supply power to the grid during peak demand and to ensure long-term network stability. Being that KOPS II uses the same reservoirs, no additional water was needed compared to KOPS I. Also, KOPS II uses an existing high-voltage line currently used by KOPS I. Construction began at Kops II in 2004/2005. Construction of not only the tunnel, but the entire hydropower plant, was under strict watch as an Environmental Impact Assessment (EIA) was initiated. More than 500 regulations had to be followed assuring that construction would be done in an environmentally friendly way and in a tight time frame of 42 months.

The plant is almost totally constructed inside the mountains in order to preserve the natural beauty of the Montafon Valley. It has a 5.5 kilometre pressure tunnel, 1.1 kilometre pressure shaft, 140 metre surge shaft, and a new powerhouse located inside a cavern. As a result, the environmental impact assessment for the new power plant was approved by the environmental authorities in a very short time. The new plant adds about 600 GWh to the already produced capacity of 430 GWh of Kops I without any additional water consumption.

Power Plant Automation using ABB's System 800xA

Vorarlberger Illwerke AG chose System 800xA, ABB's innovative control system, for upgrading power plant automation. System 800xA integrates both the operation on site and the power station group's central control room but it also integrates with the overall Illwerke network. Each of the three units is controlled and monitored by AC 800M controllers, which are designed for redundant operation.

System 800xA covers the following tasks:

- Automatic start-up and shutdown control
- Mechanical protection (e.g. speed monitoring)
- Temperature measurements
- Alarms in the event of hazards
- Drive control and
- Turbine control

Remote I/O modules of the type S800 ensure secure connection of instrumentation. These modules are connected to the AC 800M controllers via redundant Profibus.

The modern visualization enables Illwerke to monitor their machines more precisely while, in the event of a fault, they are given an excellent indication of the cause. This substantially reduces diagnostic and repair times and therefore ultimately also the downtime of the power station as a result of fault situations.

800xA Operations - Easy to Use

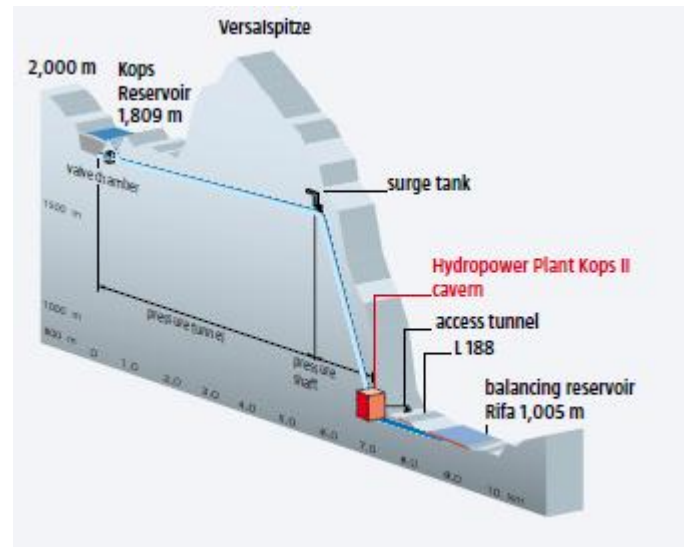
„With 800xA Operations, each individual turbine can be operated centrally from the power station's control room”, explains Karl Hirschböck, ABB's sales engineer, responsible in Austria. „However, when required operation can also take place on site using a touch screen, which is built into the door of the cabinet. In both cases, a powerful Ethernet-based network is used, which also makes it possible to network the total of four turbine controllers.“

Scope of Supply

- Power Plant Automation System
- Isolated Phase Bus Bars
- Engineering and Design
- Erection
- Commissioning

Plant data

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| • Plant Type: | Pump Storage |
| • Commissioning: | 2008 |
| • Installed Power: | 3 x 150 MW |
| • Turbine Type: | Pelton |



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