



Thyssen Schachtbau wins contract for an 820 m raise-bore shaft for the pumped storage power station in Kärnten

Electricity produced from water is one of the most environmentally friendly forms of energy and Austria with its natural abundance of water resources is well placed to exploit this rich source of power. Hydro electricity has a long tradition in the Möll valley. The Reisseck/Kreuzeck and Malta power station systems are now to be connected up via the new Reisseck II pumped storage installation so as to make the best possible use of the existing technical resources. Thyssen Schachtbau GmbH has been commissioned to participate in the project and will use the raise-boring technique to construct an 820 m-long pressure shaft and two pilot holes for the 150 and 120 m-long surge chambers.

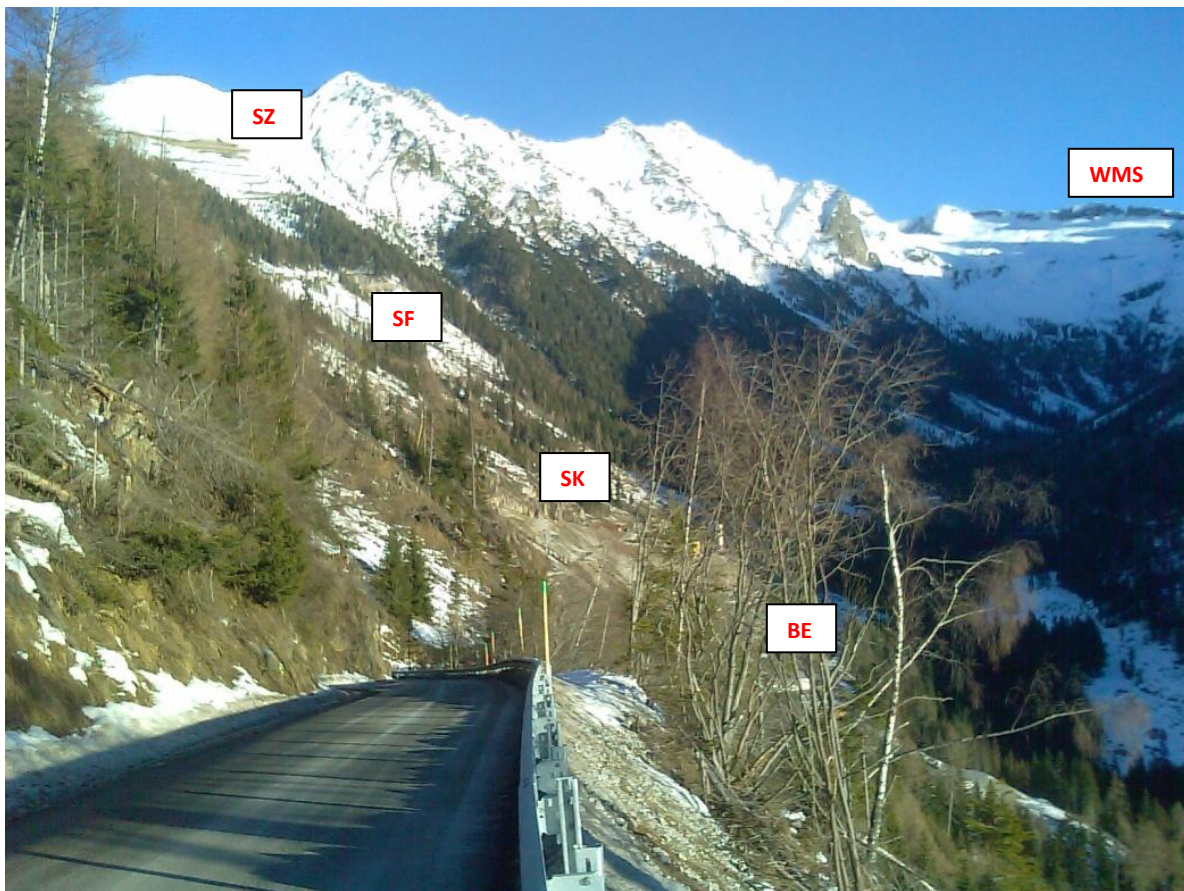


Fig. 1: View of the Mühldorf valley showing the construction site (BE), the portal for the underground power station (SK), the Schoberboden II entry and access tunnel (SZ) and the Grosser Mühldorfer See water reservoir (WMS).

Hydro electricity is one of the most eco-friendly forms of energy and Austria with its natural abundance of water resources is well placed to exploit this rich source of power. Hydro electricity has a long tradition in the Möll valley. The Reisseck/Kreuzeck electricity generating system, with its power station at Kolbnitz, was built between 1948 and 1961 and currently makes a valuable contribution to peak power loads. The Malta pumped storage installation, with its three power stations Galgenbichl, Rottau and Möllbrücke, has since 1978 been one of the most productive power-plant groups in the whole country.

The separate hydraulic systems of the two **VERBUND Group power stations of Malta and Reisseck/Kreuzeck** are now to be connected to the **Reisseck II** pumped storage power station in order to make the most effective use of the existing technical resources. By building the Reisseck II



pumped storage station the VERBUND AG will be extending and modernising the Malta/Reisseck power station group and will as a result be investing in the expansion of the Austrian hydro electric industry.

The project will make use of existing installations, thereby ensuring a minimum impact on the natural environment. The hydraulic connection will be made via a new 5.3 kilometre-long headrace channel, with the existing Grosser Mühldorfer See reservoir, as the upper basin, being connected with the existing headrace of the Rottau power station via the new underground headrace tunnel. The Rottau headrace leads on to the two lower basins of the Malta power station group, namely the Gösskar and Galgenbichl reservoirs.

The Reisseck II project has gone through the official approval procedure for assessing the environmental impact and is now being implemented along with a broad package of ecological measures designed to protect the local fauna and flora.

The Reisseck II pumped storage power station, which represents a total investment of some 385 million euros, will provide a significant boost to the Austrian economy. With construction set to last just over four years the new Reisseck II VERBUND pumped storage facility is scheduled to start operation in the autumn of 2014.

The new underground power station, which will be the centrepiece of the Reisseck II installation, will be constructed some 200 metres deep into the right flank of the Mühldorf valley, about 1,600 metres above sea level. This underground generating station will contain two pump-turbine sets each of 215 megawatts output. With a total delivery of 430 megawatts the new power station will boost the turbine output of the Malta/Reisseck power station group by more than 40 percent from the current 1,029 megawatts to 1,459 megawatts.

The contract to construct the vertical and steeply inclined chambers was awarded to the Graz-based Austrian affiliate of Thyssen Schachtbau GmbH, Mülheim an der Ruhr, in December 2010.

The key feature of the project is the **pressure shaft, which is an 820 m-long, 4.3 m-diameter inclined tunnel set at 42° from the horizontal.** This shaft will connect the surge-tank bottom chamber in the Schoberboden construction sector with the lower flat section that serves as the intake to the Burgstall underground power station. The excavation will be carried out in three stages with intermediate access via the drainage gallery and entry tunnel. The pressure shaft starts at a point 2,225 m above sea level and descends to an altitude of some 1,650 m, giving a height difference of about 575 m.

The water management system will also require the construction of two surge chambers: the **Schoberboden chamber will be 150 m in length** and its shaft collar will be about 2,380 m above sea level, while the **Burgstall surge chamber will have a length of 120 m** and its shaft collar will be about 1,740 m above sea level. The two surge chambers will be excavated from a pilot hole, followed by drilling and blasting. **The 1.8 m-diameter vertical pilot hole drillings will be completed by Thyssen Schachtbau GmbH.**



Fig. 2: The specially commissioned Rhino raise boring machine

by Thyssen Schachtbau GmbH.

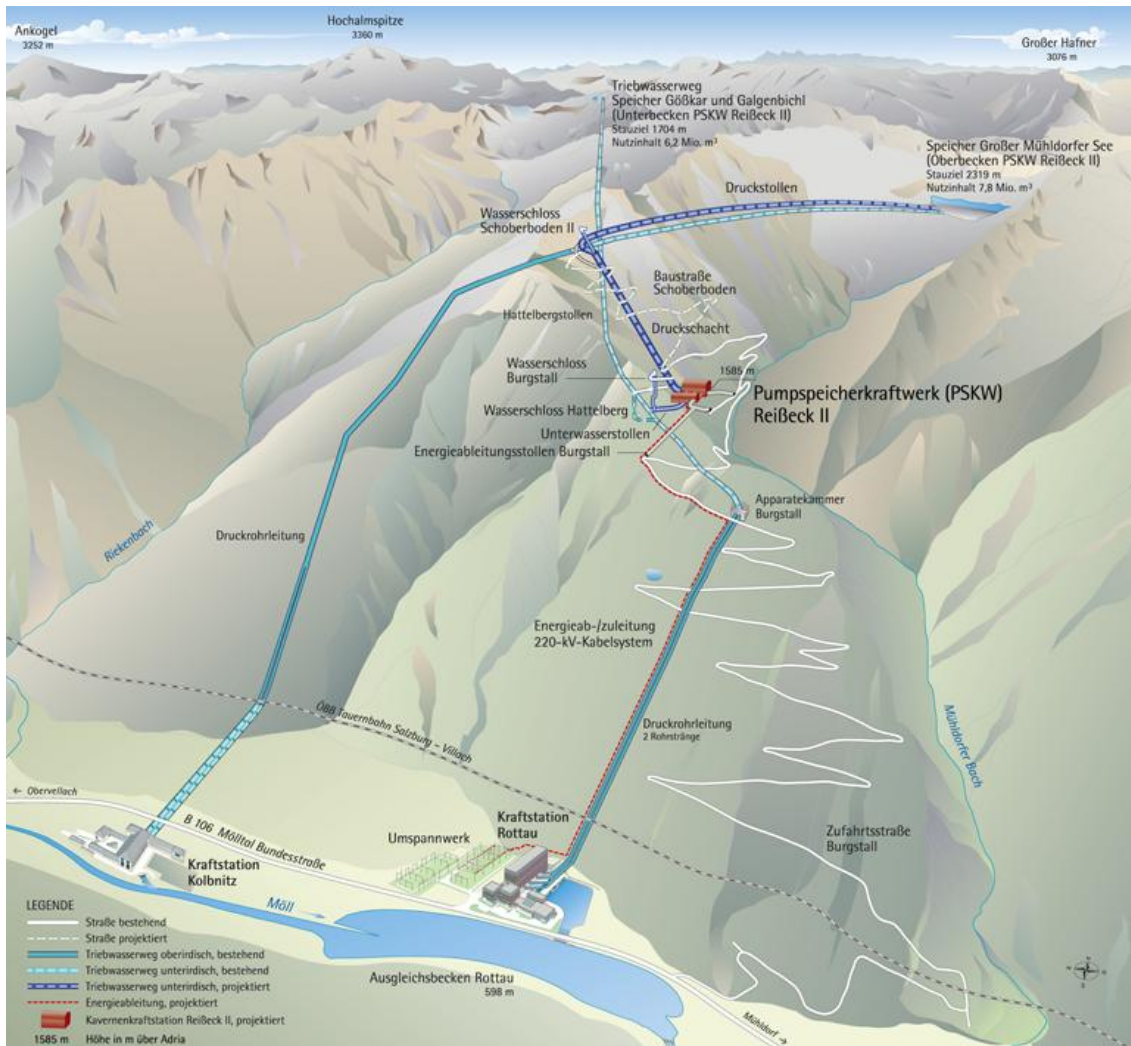


Fig. 3: The headrace tunnels, pressure shaft and surge chambers are marked in dark blue and the underground power station is shown in red.

After many years of experience in raise boring work worldwide Thyssen Schachtbau GmbH now has an opportunity to use its expertise closer to home in the Austrian Alps and has specially commissioned the Rhino 2007X raise boring machine for the job.

The client is VERBUND-Austria Hydro Power AG.

The contractor is the PSKW Reisseck II consortium, which comprises project partners G. HINTEREGGER & Söhne, ÖSTU-STETTIN, PORR TB and SWIETELSKY TB.

Dipl.-Ing. Franz Stangl,
Dipl.-Ing. Raimund Bartl

Sources:

Verbund AG: Electricity from water power
The Reisseck II pumped storage power station
Infolder 2010; www.verbund.com

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