Tierfehd

Switzerland

By Martin Haas
martin.haas@andritz.com

In October 2015, the Final Acceptance Certificate (FAC) for the Tierfehd pumped storage power plant was received. Delivered to the fullest satisfaction of the customer – the major Swiss utility Axpo Power AG – HPP Tierfehd was planned as an extension of the existing system of Kraftwerke Linth-Limmern AG. Located in the canton of Glarus in central Switzerland, the main production equipment of this large hydro scheme was first installed in the early 1960s.

ANDRITZ HYDRO was awarded a turnkey contract for the supply of the complete electro-mechanical package for HPP Tierfehd, including automation, EPS, and auxiliary systems. The heart of the project is a reversible pump turbine unit with a net head of more than 1,000 m. Due to the extraordinary high head for a Francis pump turbine, a design with four stages and fixed guide vanes was applied – a layout found only in very few pump turbines around the world.

In pump mode, the unit is started by means of a six-jet-Pelton turbine before the motor-generator is synchronized to the grid. The entire system is installed in a vertical pit more than 70 m deep to provide a sufficient suction head for the pump. It is connected to the original penstock by a system of three spherical valves, which were also supplied by ANDRITZ HYDRO. The project was executed by cooperating ANDRITZ HYDRO teams from Switzerland, Germany, and Austria.

HPP Tierfehd was first commissioned in 2009. Later the motor-generator underwent some improvements so that the plant in its final configuration was put into operation in 2012. It is predominantly used in pump mode, but is also capable of switching from pump to turbine mode and vice versa in a remarkably short time. This feature proved very valuable to the customer in an increasingly volatile electricity market. ■

Pump turbine unit with four stages

TECHNICAL DATA	
Output	141 MW
Voltage	13.8 kV
Head	1,050 m
Speed	600 rpm
Runner diameter	2,260 mm

Areal view on Lake Limmern and Limmern Dam