Reliable measurement despite difficult conditions

Schluchseewerk AG relies on Prosonic Flow W 400 for optimized turbine operation

Schluchseewerk

For decades, Schluchseewerk AG has been one of the largest operators of pumped storage plants in Germany. Schluchseewerk AG provides a maximum output of over 1800 MW in five power plants with a total of 20 machine sets. As Germany's largest long-term storage station, the lake Schluchsee is an integral part of the generation and storage of clean electricity.

"Thanks to Endress+Hauser, we were finally able to find a solution for our difficult measuring task. The comparison measurement confirmed the accuracy and reliability of the ultrasonic flowmeter, which is why we have now equipped all four turbines of the pumped storage plant with Prosonic Flow W 400."

Andreas Huber
Deputy plant manager

Andreas Huber

Bird's eye view of the Wehra basin

Schluchseewerk AG wanted to record and optimize the efficiency of its turbines at the pumped storage plant in Wehr, Germany, despite difficult flow conditions. For this purpose, it was looking for a reliable flowmeter. Endress+Hauser offers the optimum solution for the challenging measuring point with the clamp-on flowmeter Proline Prosonic Flow W 400.

The customer requirement

At the pumped storage plant in Wehr, large quantities of water are pumped from the Wehra basin into the Hornberg basin, which is at a higher elevation. When the water flows back, electricity is generated using a turbine and generator. Until now, instead of being measured directly, these water masses were only calculated using the basin size and turbine output. However, precise measurement of the water volume is extremely important for recording and optimizing the efficiency of the turbines. The geometry of the impellers was to be changed based on a performance optimization of the turbines. In order to verify the improved performance at the same flow rate, a precise measurement was required on the turbine.
However, due to the difficult conditions, Schluchseewerk AG was initially unable to find a satisfactory flowmeter. Large pipes with a diameter of up to two meters (80"), high pressures of over 60 bar (870 psi), pipes that are difficult to access and difficult flow conditions with very short inlet runs made accurate and reliable measurements impossible.

Our solution

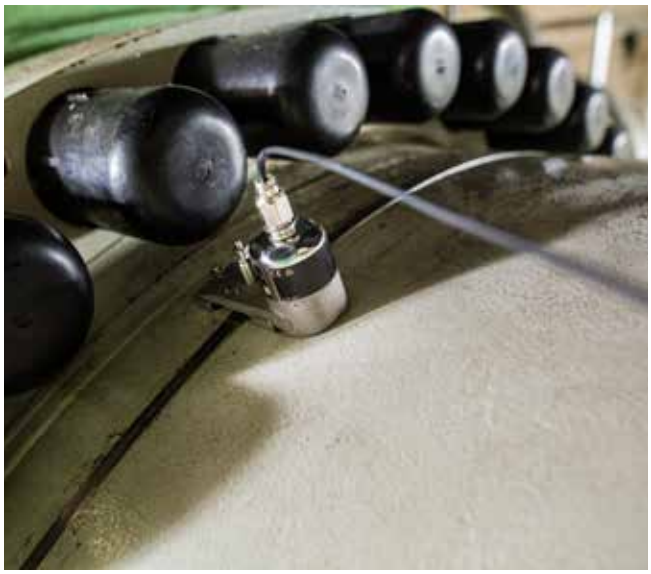
With Proline Prosonic Flow W 400 and the unique FlowDC function, Endress+Hauser offers the optimum solution for the above-mentioned challenges. The noninvasive ultrasonic flowmeter is installed from the outside on pipes with a nominal diameter of up to four meters. It measures independently of the pressure and is easy to install, saves space and does not interrupt the process. Even with shor-

test inlet runs (≥2 × DN) and disturbed flow profiles, FlowDC offers consistently high accuracy.

The result

- Precise measurement of the water volume despite short inlet runs and disturbed flow profiles thanks to FlowDC function
- Precise determination of turbine efficiency
- Optimum process control and monitoring
- Basis for verifying the increase in performance

More information about FlowDC function



▲ The clamp-on sensor is simply attached to the pipe

▼ Tough conditions: Installation at the difficult-to-access measuring point

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