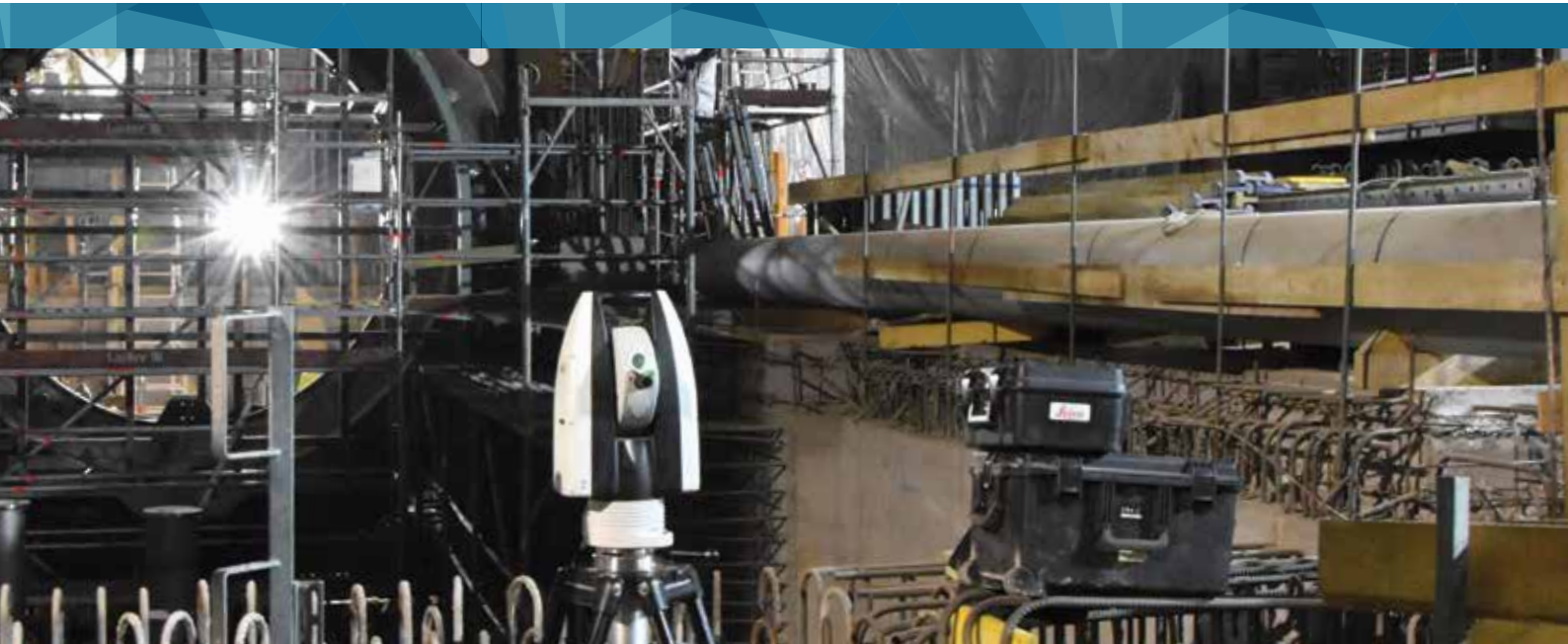


ABSOLUTE PORTABILITY AND PRECISION

LEICA ABSOLUTE TRACKER AT960

AT VORARLBERGER ILLWERKE AG, AUSTRIA



Leica Absolute Tracker
AT960 meets every
challenge below the
earth's surface

BY ILONA BIHLMAYER

In May 2014, Vorarlberger Illwerke AG started the Obervermuntwerk II project, the construction of the company's second-largest pumped-storage power plant, at 360 megawatts. The setting of this large-scale project is Vorarlberg's Silvretta range, located at an altitude of 1700 metres in the region of inner Montafon, between the two impounding reservoirs Silvretta and Vermuntsee.

Being a parallel powerhouse to the Obervermuntwerk that was built in 1943, the new power plant allows for even more efficient energy generation. It also provides further capacities for temporary storage of power at optimal efficiency, without requiring additional water resources. The start-up of the new power plant is planned for 2018. With the construction of the Obervermuntwerk II,





Before the reinforcement of its housing is cemented, the turbine spiral is exactly aligned with the Leica T-Probe.

Vorarlberger Illwerke AG makes a significant contribution to the integration of renewable energies in Europe.

Obervermuntwerk II is mostly operated in an underground cavity blasted out of the rocks – this is why such a plant is called a “cavern power plant“. The cavern is 140 metres long, 33 metres wide and 35 metres high. Here, two horizontally mounted units are installed, including Francis turbines, clutches, motor generators, starting converters and storage pumps. In order to enable an economical interplay between these components, without wear and tear, they have to be exactly assembled, mounted and aligned to each other at the correct angles.

High project costs and a tight schedule combined with the harsh conditions of underground mining were the main challenges facing Vorarlberger Illwerke. For these demanding measurements, a precise, robust and utterly portable measuring system was required.

Vorarlberger Illwerke AG had already acquired a Leica Absolute Tracker AT901. It provides the required precision for work in a cavern, but is not robust and portable enough to meet this latest challenge. That’s why Ralf Laufer, Department Manager Metrology, opted to add a Leica Absolute Tracker AT960 combined with the Leica T-Probe and the Leica T-Scan 5 to his department’s toolkit. “This

system makes underground measurements and alignments possible. No other measuring system currently on the market provides such portability and robustness at accuracy in the micrometre range.”

High humidity, dust in the air, vibrations and partly reduced visibility are no problem for a measuring system built around the AT960. “Thanks to the IP54 certificate, the system is extremely reliable. Through the integrated weather station, the influence of environmental changes is compensated, which enables stable measurement results. Furthermore, the levelling function of the tracker is essential for us, for example for the vertical alignment of the spirals to each other and to the upstream connections.”

Looking around in the cavern, it becomes clear that tight space conditions, challenging grounds and a difficult approach to the measuring object are unavoidable, but about such concerns, Ralf Laufer is relaxed: “The Leica Absolute Tracker resists these challenges through its portability and robustness, as well as through the WiFi-function and economical battery operation. Here, Hexagon proves that it is possible to apply high-end technology in a difficult environment.”

Besides the construction of the new power plant, the team is also responsible for providing metrological support to the

maintenance of the existing power plants of Illwerke VKW. To keep them working optimally, a regular control of the plant is essential. "Scanning the paddle wheels of our turbines allows us to detect wear and tear, to figure out the cause and solve it."

This inspection is carried out with the Leica T-Scan. Its exact and precise scanning results show wear and stress of the blades. "General overhauls of plants are just as important as maintenance. We are keen on increasing the efficiency of our power plants as well as making technical improvements. Thanks to the portability of the Leica Absolute Tracker AT960, we are able to carry out many measurements with installed components and without plant shutdown".

“ This system makes underground measurements and alignments possible.

Besides the Leica Absolute Tracker AT960 with Leica T-Scan 5 and Leica T-Probe, Vorarlberger Illwerke AG also has a ROMER Absolute Arm with Integrated Scanner. This is used for smaller measurement volumes and in hard-to-access areas, for example for scanning the bucket roots of pelton wheels.

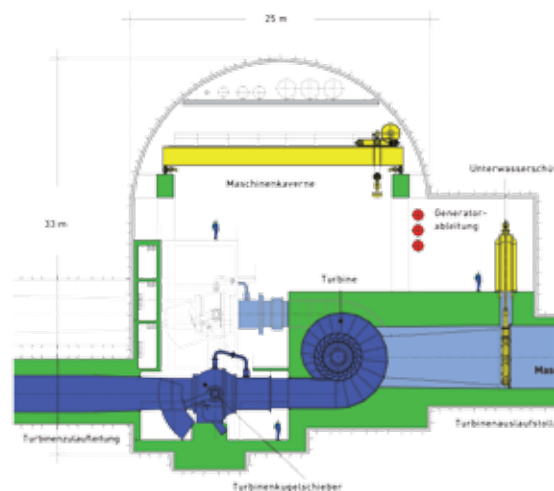
Ralf Laufer gives another reason for the renewed choice of a Hexagon system: "My team and I appreciate the possibility to acquire complementary systems from one provider. We are in good contact with our responsible sales manager. He is always able to thoroughly advise us, he helps us find solutions for our measurement requirements. On top of this, he always supports us even after the acquisition."



Absolute Portability: The laser tracker and its equipment are perfect for applications in a cavern.



The Hexagon sales manager advises the measurement team at Vorarlberger Illwerke AG regarding special challenges.



Cross section of the power plant cavern.











Source: Vorarlberger Illwerke AG



Hexagon Manufacturing Intelligence helps industrial manufacturers develop the disruptive technologies of today and the life-changing products of tomorrow. As a leading metrology and manufacturing solution specialist, our expertise in sensing, thinking and acting – the collection, analysis and active use of measurement data – gives our customers the confidence to increase production speed and accelerate productivity while enhancing product quality.

Through a network of local service centres, production facilities and commercial operations across five continents, we are shaping smart change in manufacturing to build a world where quality drives productivity. For more information, visit HexagonMI.com.

Hexagon Manufacturing Intelligence is part of Hexagon (Nasdaq Stockholm: HEXA B; hexagon.com), a leading global provider of information technologies that drive quality and productivity across geospatial and industrial enterprise applications.

-  COORDINATE MEASURING MACHINES
-  3D LASER SCANNING
-  SENSORS
-  PORTABLE MEASURING ARMS
-  SERVICES
-  LASER TRACKERS & STATIONS
-  MULTISENSOR & OPTICAL SYSTEMS
-  WHITE LIGHT SCANNERS
-  METROLOGY SOFTWARE SOLUTIONS
-  CAD / CAM
-  STATISTICAL PROCESS CONTROL
-  AUTOMATED APPLICATIONS
-  MICROMETERS, CALIPERS AND GAUGES
-  DESIGN AND COSTING SOFTWARE