

FROM: Mavel, a.s.
Jana Nohy 1237
256 01 Benesov, Czech Republic



CONTACT: Laurie Sigmund
617.242.2204
Laurie@mavel.cz

MAVEL INSTALLS FIRST UNIT AT PRAGUE'S HISTORIC ŠTVANICE HYDROELECTRIC POWER PLANT - OUTPUT INCREASE 25% ABOVE PLAN -

Benešov, Czech Republic – 8 August 2018 – M a v e l, a.s. (“Mavel”) announced the successful installation, testing and commissioning of the first of three generating units at the Štvanice Hydroelectric Power Plant (Štvanice HPP) on the Vltava River in central Prague, Czech Republic. The output of the new double regulated Kaplan "S" turbine Mavel **Model KS3400K4** exceeded guaranteed values by more than 25%.



Prague's Štvanice Hydroelectric Power Plant

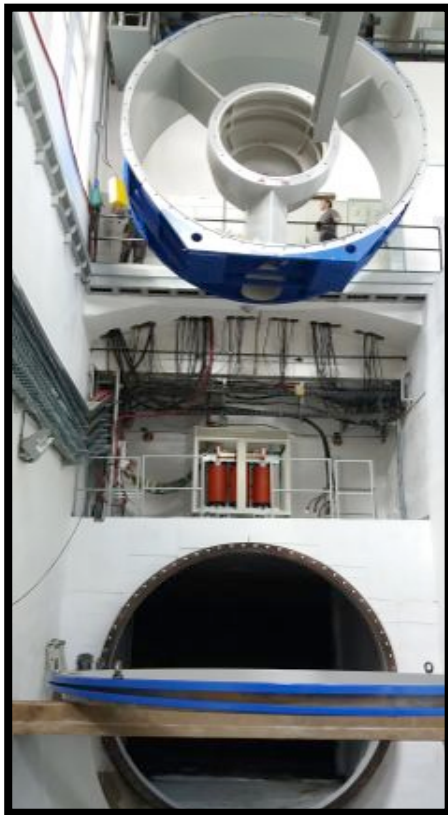
The original Štvanice HPP was completed in 1914, when the Czech Republic was still part of the Habsburg Empire. The plant was decommissioned in 1972. Eventually, the state power utility completely renovated the plant. The original architecture and landscaping was preserved and the Štvanice HPP was back online in 1987. The renovated plant housed three Kaplan “S” turbines, each with a flow capacity of 55 cms, head of just under 4 meters, direct generator coupling and stated installed power of 1.9 MW. Over the past few years, the efficiency of the turbines declined while problems with the bearings increased.

In August 2017, Mavel was awarded the contract to perform the refurbishment by Povodi Vltavy s.p., a Czech water management authority overseeing all activities related to the Vltava River. Mavel's

engineering, procurement and construction (EPC) contract was for the complete rehabilitation of the power plant, including mechanical and hydraulic design, replacement of three horizontal turbines, refurbishment of generators, supply of a control system and all related civil work.

The first phase of the contract was engineering with the goal of maximizing the potential of the site. Design engineering was constrained by the need to maintain the historic powerhouse and minimize changes to water currents so as not to interfere with the many tour boats in that area of the river.

Using Computational Fluid Dynamics (CFD) modeling, Mavel engineers found that reversing the rotational direction of the turbine would maximize the energy potential and minimize losses in the inlet and draft tube. Hence, Mavel developed a new hydraulic design for the turbine customized for the specific hydraulic parameters and requirements of the Štvanice HPP. The first of the new four blade, 3400 mm runner diameter horizontal Kaplan turbine was installed with a counterclockwise rotational direction. The solution allowed for the use of the existing generators, which were refurbished and also adopted for the directional change.



Installation of Unit 1 at the Štvanice HPP

"Mavel does not simply manufacture turbines at our headquarters outside of Prague," according to Jan Sip, Mavel Management Board Member and lead for research and development initiatives. "Mavel solves engineering problems for our customers. That is what we are best at. That is what sets us apart. Mavel's engineering team is driven to discover innovative solutions to traditional problems. The solution for Štvanice HPP was extraordinary for its simplicity," he noted.

Prior to refurbishment the maximum power per unit was 1.6 MW. Mavel's contract mandated a guaranteed output of 1.75 MW. The new Mavel turbine reached 2.1 MW before the output was limited due to the capacity limitations of the existing generator.

Ing. Jiri Veis, the Chief Executive Officer of Mavel, noted that this project is a significant step forward for Mavel in two strategic areas; EPC contracting and refurbishment.

"First," he explained, "the Štvanice HPP contract is an EPC contract. Where usually Mavel is an equipment supplier, for the Štvanice HPP project, Mavel is overseeing design, civil construction, mechanical and electrical equipment supply, installation and commissioning. Second, where normally Mavel provides a completely new generating unit, Štvanice HPP is one of the first major refurbishment projects for Mavel encompassing the integration of new turbine components into an existing generating unit."

Installation of the first unit began in January 2018 with full commissioning in March 2018 and performance testing completed in July 2018. Installation of the second unit is underway and expected to be completed next month with the third and final unit commissioned in May 2019.

Mavel, a.s. is a global leader in the supply of turbines (Kaplan, Francis, Pelton and Micro) for hydroelectric power plants from 30 kW to 30+ MW. Over the past twenty plus years, the company has installed or signed contracts for over 500 turbines at more than 325 sites in 43 countries around the world. The 50% American owned Czech company designs and manufactures its turbines and related equipment at its ISO certified facilities in the Czech Republic.