

SFMCP

Expert investigation of a century-old waterwheel

The operator of a hydroelectric power plant located in Chancy-Pougny, in Rhône, France, and Cetim's experts carried out several analyses and investigations on a one-hundred year old waterwheel in order to ensure that it was in good working order.



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OUR CUSTOMER

Corporate name

Société des Forces Motrices de Chancy-Pougny (SFMCP)

Workforce

10 people

Business activity

Société des Forces Motrices de Chancy-Pougny (SFMCP) is a French-Swiss joint venture between Compagnie Nationale du Rhône and Services industriels de Genève (SIG). It manages the operation and maintenance of the Chancy-Pougny hydroelectric power plant.

In 2014, the power plant was equipped with four new 12.5 MW Kaplan turbines with a flow rate of 130 to 1,100 m³/s alongside an original Francis turbine with a generating capacity of 8.8 megawatts and a flow rate of 110 m³/s. The plant currently provides 250 GWh, i.e. 8.3% of the power consumption of the Canton of Geneva.

Built in 1920, the Chancy-Pougny power plant is located on the border between France and Switzerland, between the municipalities of Avully (Canton of Geneva) and Challex (Ain, France).

Société des Forces Motrices de Chancy-Pougny (SFMCP), its operator, opted to replace four Francis turbines with more modern Kaplan-type equipment and to retain the fifth turbine, which is 100 years old.

In 2016, to guard against any failures, the company tasked Cetim's experts with determining the secret of the design and manufacture of the fifth wheel in order to then iden-

tify the appropriate procedures for in-service support over the upcoming forty years.

Control wheel

Samples were taken from one of the replaced wheels (25 tonnes and 5.5 meters in diameter), carefully stored and transferred to Cetim's laboratories for a series of examinations which included the characterisation of the various moulded or laminated steels, identification of the wheel and hub assemblies, destructive tests on a number of components, 3D scan of a blade for possible replacement or repair welding in addition to tensile tests.

"Once this phase of collecting data was completed, checks had to be carried out on site to determine that wheel No. 5 was indeed identical", stated Emmanuel Maginot, project engineer at the Compagnie Nationale du Rhône. After taking the necessary precautions to

protect the safety of people and equipment, Cetim's experts were able to scan the blades, model the assembly, identify specific characteristics, the metal sheets added on as well as the welds performed during previous maintenance campaigns.

A technical maintenance file

Upon completion of these analyses, they provided SFMCP with a complete report and, most importantly a technical maintenance file, a sort of handbook of maintenance procedures that takes into account the collected data and past knowledge. *"This handbook of procedures is extremely valuable",* explained Emmanuel Maginot. *It tells us exactly what to do and how to do so in the event of a problem. With this compilation of instructions we are confident in our ability to keep this wheel in good working order",* he added.

Cetim's asset



Based on physical elements and the results of investigations, Cetim's experts are able to identify the design and manufacturing methods of a structure in service and determine the instructions to be applied to ensure it is kept in good working order.