

Media Release

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The hydropower plant's "ear": Landsvirkjun and Voith launch joint pilot project in Iceland

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- **Budarhals hydropower plant to be fitted with intelligent acoustic monitoring system**
- **Voith tests new remote data-analysis service**
- **Optimized mode of operation and intelligent scheduling of maintenance work for power plant operators**

Heidenheim/Reykjavík. The national Power Company of Iceland Landsvirkjun and Voith have launched a joint pilot project on intelligent noise analysis in hydropower plants. Voith is installing an acoustic monitoring system in the Budarhals hydropower plant in Iceland that detects turbine noise that deviates from normal conditions to prevent potential shutdowns in good time. In addition, the continuous analysis of machine data is designed to facilitate an optimized mode of operation and the intelligent scheduling of maintenance work. The system is set to go into operation in September 2018.

Identifying turbine damage in good time

"We are installing a system in the Budarhals power plant that permanently evaluates the acoustic condition of the machines," explains Bastian Berg, project manager and specialist in automation and data analysis at Voith Digital Solutions. "Using artificial intelligence, the system will complement the monitoring of the power plant and preventive maintenance undertaken by personnel and identify potential machine damage in good time." To this end microphones will be mounted at specified locations in the power plant and will record all ambient noise to store it in the Voith Bluebox for preprocessing. The final data interpretation will be done at a special Voith platform. For calibration purposes, the system records all acoustic signals in an initial learning phase. In doing so it complies with strict data protection guidelines. The data collected is then compared with that of other hydropower plants. Due to the combination with the operating data

the application learns which noises correspond to normal machine behavior. In a second learning phase, the system is capable of immediately recognizing deviations from the typical noise pattern. In this case the system sends out a warning and at the same time notifies one of the power plant operator's service technicians.

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Data-based service for optimized operation and maintenance

In the pilot project at the Budarhals power plant in Iceland, Voith is testing a new service model for its noise pattern analysis for the first time. The system uses a data-based approach and is intended to help power plant operators to optimize maintenance and operation.

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"After the system is installed in the power plant we expect between 10 and 15 unknown ambient noises every day in the initial phase. These first have to be analyzed manually and documented," explains Bastian Berg. "The system learns continually and becomes more and more intelligent over time." To keep the customer's work to a minimum, Voith is offering a 24/7 service for this pilot project, in which the unknown noise is evaluated by a Voith expert very quickly. If the noise suggests a critical or atypical machine status, the customer's control room is informed immediately.

As the pilot project proceeds, the system should work more and more autonomously and identify more noises. In combination with various KPIs, the data collected is then investigated and analyzed for complex correlations by the Voith experts and a team of data analysts. The results are then provided as a regular report to the power plant operator, allowing operation and maintenance to be optimized. The content of the report is adapted to customer needs on an ongoing basis and the added value verified together with customer. "In future we will be able to use our noise pattern analysis to tell the operators of hydropower plants the ideal time for replacing mechanical components, for example. Maintenance work and forthcoming repairs can therefore be planned transparently and very efficiently," says Berg.

About the Budarhals power plant

The Budarhals facility was officially opened in 2014 and has an installed output of 95 MW. It has a capacity of around 585 GW hours per year. Voith has equipped the plant with two modern, environmentally friendly Kaplan turbines with water-filled impellers and cutting-edge generators with specially developed brushless and bluetooth thyristor-controlled excitation systems. Apart from the main components of the electromechanical

equipment and the control systems, Voith also supplied the crane systems for the plant's powerhouse.

With this current pilot project Voith is successfully continuing its long tradition of doing business in Iceland. As far back as 1912, the company built the first complete turbine installation in the Fjardarsel power plant. This system has a capacity of 550 kW, is driven by a horizontal Francis turbine and is the oldest power plant in Iceland still in operation.

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About the company

Voith Hydro is a leading full-line supplier and trusted partner for equipping hydropower plants. The Voith Group Division develops customized, long-term solutions and services for large and small hydro plants all over the world. Its portfolio of products and services covers the entire life cycle and all major components for large and small hydro plants, from generators, turbines, pumps and automation systems, right through to spare parts, maintenance and training services, and digital solutions for intelligent hydropower.

Voith is a global technology group. With its wide range of plants, products, services and digital applications, Voith sets standards in the markets for energy, oil and gas, paper, raw materials and transport & automotive. Founded in 1867, Voith today has more than 19,000 employees and earns 4.2 billion euros in sales. It has locations in over 60 countries and is one of the largest family-owned companies in Europe.



Caption: The Budarhals power plant in Iceland.

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