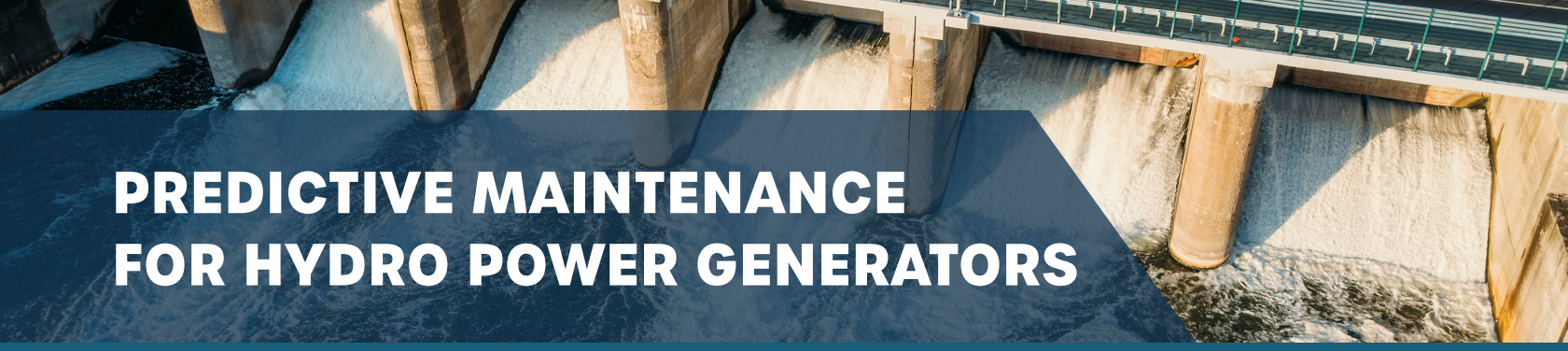

PREDICTIVE MAINTENANCE FOR HYDRO POWER GENERATORS

ÆGIR CASE STUDY

Sira-Kvina Kraftelskap, a Norwegian hydropower company, needed to predict component failure and avoid unplanned downtime, causing tens of millions in lost revenue. Our Ægir Predictive Maintenance Solution™ was put in production, providing real-time alerts and predicting likely fault events for technical intervention.

THE CHANLLENGE

The Sira-Kvina Kraftelskap power company is one of Norway's primary renewable energy power providers, producing approximately 5% of the country's power from seven hydro power plants.

Sira-Kvina was struggling to tie their data together from disparate and heterogeneous operational systems, and thus unable to make informed decisions. On average, **one of the hydro generators going down creates a loss of approximately $1 million/day,** as well as negative customer sentiment and trust.

When technicians went through established diagnostics to identify causes they were often unable to pinpoint the trouble because there was far too much data to review manually. This could cause shutdowns to drag on for months.

Sira-Kvina needed a trusted data and analytics partner and engaged Elder Research to hand-craft a data strategy that fit their organization and their ability to absorb transformation. Furthermore, they needed Elder Research to design and deploy predictive models that would determine the risk of hydro generator component failure and enable both preemptive maintenance operations and system monitoring.

THE SOLUTION

Using our Ægir Predictive Maintenance Solution™, Elder Research's data science and engineering team worked hand-in-hand with Sira-Kvina leaders, operators, and stakeholders to design and build machine learning models using various operational and maintenance data sources.

There was an immense amount of data with hundreds of sensors that produced minute-by-minute readings on the bearings, rotors, turbines, subcomponents, and more, but our team developed a model of the generator systems that could be linked to key operational and sensor data systems.

In order to aid in analytic storytelling, change management, and adoption of data-driven decisions, the generator risk and other relevant data were represented in a visual layer in our Ægir Predictive Maintenance Solution™.

INDUSTRY

Energy

BUSINESS NEED

Sira-Kvina Kraftelskap, a hydropower company providing 5% of Norwegian electricity, needed a solution to predict component failure and avoid costly unplanned downtime, causing tens of millions in lost revenue.

SOLUTION

Using the Ægir Predictive Maintenance Solution™, Elder Research identified the cause of a complex, expensive generator failure that was indecipherable using traditional techniques.

BENEFIT

Our solution achieved a 500% boost in predictive performance and is now in production, providing real-time alerts and predicting likely fault events for technical intervention, providing 45% ROI within just the first year.

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THE RESULTS

Elder Research's focused data discovery and exploration identified that the generator had moved into a damaged state eight power cycles earlier than had previously been observed by the Sira-Kvina maintenance team. We brought our findings to the experts at Sira-Kvina, who found the following:

- Vibration level was 30% higher in the case where the cold start was present. Vibrations cause stress on the components.
- Generator heaters were suspected to have not been working properly, causing the cold start.
- This cold start was proven to be the culprit in causing this massive, extremely expensive generator failure

We created a predictive model that was trained on the SCADA sensor data and **achieved a 500% boost** in predictive performance above the baseline.

Thus, our models helped Sira-Kvina operators identify issues much earlier and more accurately (less false positives and false negatives), giving operators the opportunity to strategically approach each maintenance issue in a cost-optimal fashion.

Using the Elder Research's streaming data anomaly detection system in our Ægir Predictive Maintenance Solution™, sensor metrics were reduced from hundreds to the ten that provided the best predictive performance, **making the results easier to interpret and more actionable for the business going forward.**

Our solution is now in production, providing real-time alerts of anomalous behavior and predicting likely fault events for technical intervention, **providing 45% return on investment within just the first year.**

ABOUT ELDER RESEARCH

Elder Research is an internationally-recognized data analytics solution provider with over 25 years of expertise in data strategy, data science, data engineering, and training. We have operationalized innovative solutions for hundreds of organizations across diverse industries. Our hand-crafted AI and machine learning solutions inform decisions, deliver business value, and transform organizations.

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