

Predictive diagnosis for wind energy generation

Predict bearing damage in electrical generators by using and analyzing SCADA log data.

For industries that supply generated power wholesale to power companies, preventing large-scale outages is critical for stable long-term power generation. Predict hard-to-detect bearing damage in electrical generators and prevent long-term outages by using and analyzing SCADA (Supervisory Control and Data Acquisition) system log data.



Challenges

For stable long-term power generation, preventing long-term outages is crucial

- In wind energy generation, the electrical generator rotates slowly and repeatedly starts and stops, so it is difficult to predict generator (bearing) wear.
- Serious power sales revenue losses occur if bearings suddenly fail and power generation stops, since it takes a long time to bring in materials and skilled technicians.

SCADA: Supervisory Control and Data Acquisition

Solutions

Utilize log data to predict wear in electrical generators

Get early detection of electrical generator bearing deterioration and its progress by using a SCADA system as standard equipment on wind turbines. By preparing for bearing replacement in advance while the wind turbine is still running, you can replace a bearing before its failure causes a power generation failure.

Features

Advanced technical processes and know-how that make for successful optimization

- Drawing upon years of accumulated technical discernment, we focus on the optimal center group from 200 statistical data points. Also, our knowledge of wind turbine operation allows us to detect the progress of correlated wear between sensors and predict generator bearing failure.
- There is no need to add new sensors or set data granularity in order to make use of SCADA log data.

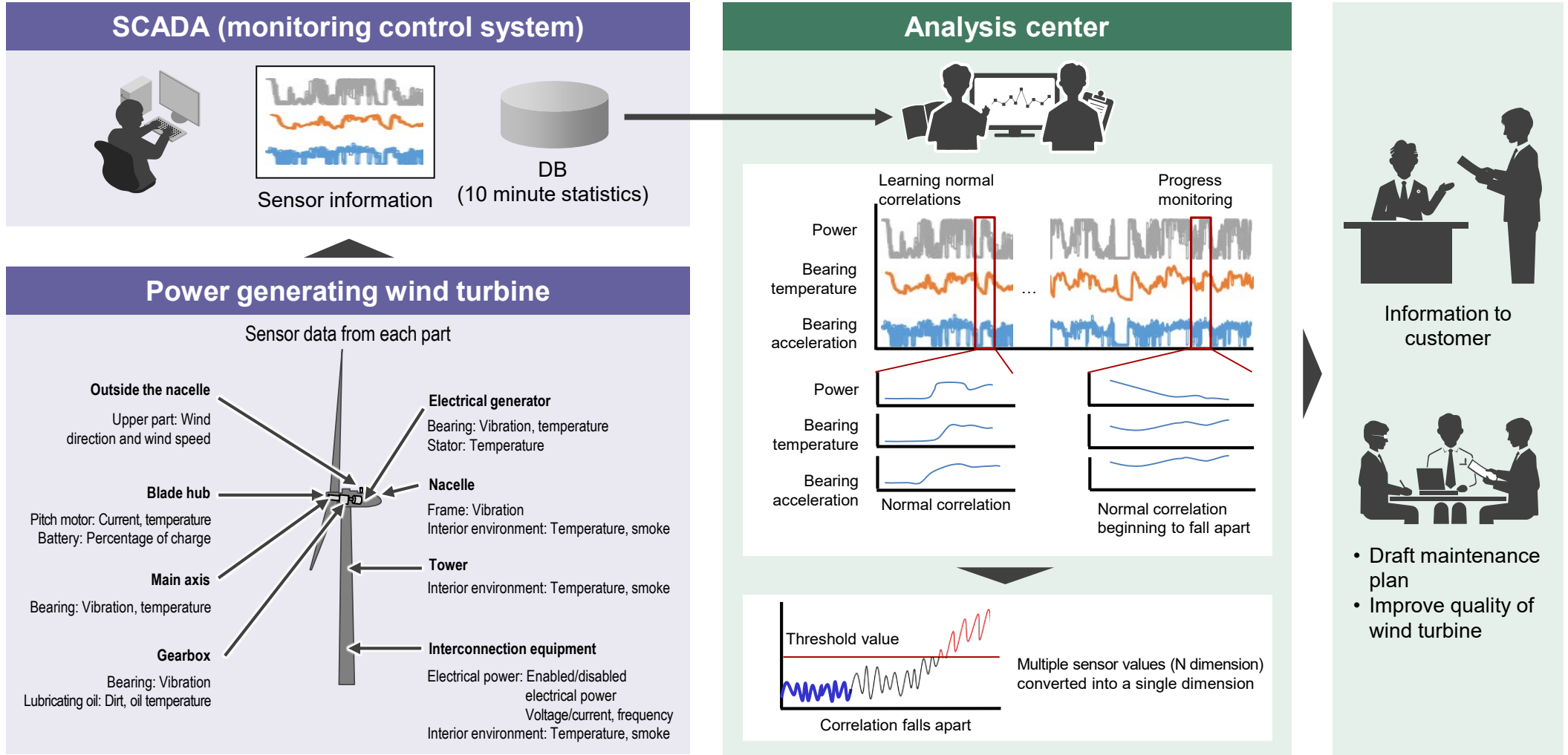
Outcomes

- **Outage time minimized (turbine stop time reduced from 60 to 5 days, loss of energy sales revenues reduced by 10–30 million yen) by early prediction of bearing failure, advance procurement of long lead time parts, and advance scheduling of workers.***
- **Eliminate outage time for repairs by performing repairs during routine maintenance.**

* The numerical values for effectiveness are based on a past project in which damage was successfully detected. Not all damage can be predicted.

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