Predictive intelligent operational management to reduce the icing risk of wind turbines

(Acronym: PiB)

www.pib-projekt.de

Project description

Wind turbines and especially rotor blades are exposed to extreme environmental conditions now and again. Depending on the location of the turbine, there is a risk of icing, especially at low temperatures and high humidity. This could lead to significant power losses and damages at the turbine, which affects the revenue. Furthermore, the grid operators have to estimate the available electric capacities precisely in order to switch capacities on or off. Forecasting methods to estimate the availability of a turbine are already in use, but the risk of icing is not considered at present.
In the framework of this research project, a new concept for anti icing systems should be proposed.

© Sandor Jackal / Fotolia

In the course of this, an enhanced forecasting model in order to analyse the meteorology datasets, the development of methods for data analysis and information acquisition based on data mining as well as the further development of the rotor blade heating system are subjects of the project. The intelligent operational management makes an early identification of the icing risk and the minimisation of the impact on the individual wind farm or individual turbine possible.
The project considers not only the current plant situation, but uses a holistic approach based on data mining and data analytics.

Besides the current SCADA data, historical, meteorological data and life cycle based data will feed into this concept. In addition to that, the system is not restricted to a wind farm or plant only, but also should make a linkage with further wind farms possible. Due to the additional available information, a holistic view over the individual icing risk for every turbine each should be compiled ■

Projekt partner

wpd windmanager GmbH & Co. KG

energy & meteo systems GmbH

SPITZNER ENGINEERS GmbH

University of Bremen, Faculty 4,
Rresearch group "Planning and Control of Production and Logistics Systems (PSPS)"

Institut für integrierte Produktentwicklung
University of Bremen

Prof. Dr.-Ing. Klaus-Dieter Thoben
Badgasteiner Straße 1
D-28359 Bremen

Fon: +49 421 218-50005

Administation (Prof. Thoben):
Fon: +49 421 218-50006
Fax: +49 421 218-50007

Administation (Institute):
Fon: +49 421 218-64868
Fax: +49 421 218-64869

Supported by:

Federal Ministry
for Economic Affairs
and Energy

on the basis of a decision
by the German Bundestag