# Wind turbine generator alignment operation

Do wind turbines need to be aligned?
Precision alignment is recommended by most wind turbine manufacturers for optimal operation and reliability. Generator efficiency can also be affected by misalignment (angular and offset). The following questions--and answers--will help you to enhance the productivity and longevity of your turbine. What needs to be aligned in a wind turbine?

How to detect a change in the alignment of Tur-Bines?
Current methods to detect a change in the alignment of tur-bines are based on wind direction in situ comparisonin case of redundancy of the device on the nacelle or by compar-ing wind direction measurements nearby (e.g.,other turbines,met masts or lidars). The absolute wind directions of one or more wind vanes in the neighborhood are compared.

How is wind turbine alignment done?
Wind Turbine Alignment is normally done by treating the gearbox as the stationary machine,and the generator as the moveable machine. The misalignment is measured almost exclusively with a laser shaft alignment tool.

Do upwind horizontal axis wind turbines need to be aligned?
Upwind horizontal axis wind turbines need to be alignedwith the main wind direction to maximize energy yield. Attempts have been made to improve the yaw alignment with advanced measurement equipment but most of these techniques introduce additional costs and rely on alignment tolerances with the rotor axis or the true north.

How long does it take to align a wind turbine?
The first turbine was aligned early in the morning in moderate wind speeds of approx. 2-5 m/s,the alignment went smoothly and we completed the alignment in about 45 minuteswith excellent alignment results. The second turbine proved to be challenging. After lunch,the wind had picked up a little but was still acceptable.

Why should a wind turbine shaft be aligned?
Properly aligned shafts are able to spin freely and not induce other unwanted forces to the system. These unwanted forces will damage and/or destroy bearings,seals,and couplings,and eventually the gearbox or generator. Precision alignment is recommended by most wind turbine manufacturers for optimal operation and reliability.

o Improved turbine reliability o Lower production costs o Reduced maintenance needs during operation Improving the performance of wind turbines has typically required design decisions ...

ters and one wind vane) to detect an alignment change of the wind direction measurement device during

operation. Re-sults and discussion of a demonstration case with a test wind turbine ...

Motor Shaft Alignment The method of offering a technical solution to monitoring the mechanical operation of wind turbine will focus on the alignment of the critical components, ...

The power generated by the wind turbine is transferred to the load via a grid. The power output of the wind turbine depends on the wind speed and it fluctuates with respect to time. So, power ...

Alignment of wind turbine generator and gearbox. We offer shaft alignment systems specially developed for alignment of wind turbines. The bracket kits included make it possible to align ...

How does a turbine generate electricity? A turbine, like the ones in a wind farm, is a machine that spins around in a moving fluid (liquid or gas) and catches some of the energy passing by.All sorts of machines use turbines, ...

The drive train alignment study confirmed that the ... A proactive plan based on the result and recommendations in this paper will help to secure the safe wind turbine ...

Wind turbines work on a simple principle: instead of using electricity to make wind--like a fan--wind turbines use wind to make electricity. Wind turns the propeller-like blades of a turbine around a rotor, which spins a generator, ...

The only safe and precise way to align both shafts of the manufacturer"s specifications accordingly is the laser-optical alignment procedure. In the process, a laser and a sensor are ...

The most common application for a modern wind turbine is a horizontal axis wind turbine (HAWT). A wind turbines power plant consists of these three major components: ... proper shaft alignment is one of the crucial components of ...

Generator Components. Most wind turbine generators are designed to run at a fixed speed so that the AC electricity is generated at the required frequency. Typically, the ...

Wind kits by VibrAlign are configured with cus-tomized magnetic mounting hardware for each OEM"s turbine design, including GE, Siemens, Gamesa, Mitsubishi, Vestas, Nordex, and ...

After pre-alignment is completed we need to mount the lasers on the gearbox brake disk and generator coupling hub. This step is extremely easy. The GO Wind and XA ...

Precision alignment of the generator to the gearbox in a wind turbine (the high speed shaft) is critical to proper operation. 60 percent of wind turbine downtime is related to drive train failure: gearbox, generator, main ...

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Equations for Wind Turbines: Wind Shear. An important consideration for turbine siting and operation is wind shear when the blade is at the top position. Wind shear is ...

1 INTRODUCTION. In 2010, commercial wind farms were being operated in almost 80 countries 1 with over 10 000 farms worldwide. 2 With the continued growth in size and number of wind ...

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