Wind turbine main shaft repair – Webinar Q&A 2024-06-18

Do you take wind turbine data into account during RCFA?

If we perform a detailed RCFA we might also take wind turbine data, mainly SCADA data into account. This depends very much on the observed failure. Some failures and their root causes are easy to identify, while others require very intensive root cause analysis incl. SCADA, load, and vibration data, especially when external conditions or turbine operation are identified as a possible contributor to the failure. The scope and associated costs of the RCFA are always discussed in detail together with customer.

Could you please elaborate a bit more on the sensor roller measurement? Will I be able to see live results?

The Sensor Roller is a tool for load & temperature monitoring. It is battery driven and measures on a defined schedule (e.g. one measurement every 4 hours) or a measurement can be triggered manually. In principle it is also capable to detect raceway damages, but the purpose of the Sensor Roller is to avoid damages by monitoring the loading conditions. One sensor roller measurement consists out of a ~20seconds record of load, acceleration, speed, and temperature of the roller. After the measurement is taken, the system transfers it wirelessly from the roller to a gateway. Now it is possible to access that gateway and analyse the measurement. You will not be able to see the data live, but with a short delay in time (just minutes).

If you reduce the shaft diameter during the repair and mount a bearing with an undersized bore diameter, how do you make sure that the type certificate is still valid?

We only go for undersized bearing inner diameter if we are sure that our customers and SKF don't come into conflicts with existing certifications. We incorporate our experience and the resulting recommendations for bearing fits when making tolerance and diameter changes to the bearing seat. SKF can evaluate the stresses and contact pressures of the bearing shaft seat based on the actual dimensions. If needed this can be evaluated in detail. Usually, we are not asked for a recertification if bearings with undersize bore are applied. At the end the final decision what is needed to be done is taken together with the customer.

What about the outer ring seat in the housing? Do you then use bearings with an oversized outer diameter in case of worn housing seats?

Yes, bearings with an oversized outer diameter are our preferred solutions if a rework of the housing seat is needed.

Is SKF using laser cladding or thermal spraying for repair of the bearing shaft seat?

If polishing of the shaft seat isn't enough our preferred and most cost-efficient solution is turning of the shaft and mounting of a bearing with an undersized bore. In exceptional cases other options can be discussed and considered together with the customer.

What if a customer does not have a ready-to-use / complete instruction? Does SKF know the technical details of each main shaft?

We have been involved in many main shaft application projects for various OEM turbine designs over the last 30 years. A lot of data on main shaft arrangement designs is available inside SKF. If crucial information is missing, we build on our vast experience and knowhow and elaborate possible solutions together with our customers. Based on our knowledge we also give recommendations to OEMs during development projects on e.g. the needed surface quality incl. roughness for main shafts. But of course, we cannot repair every design - if we lack crucial information needed for the repair we will decline the order. This needs to be evaluated in detail during the offer creation phase. But for most older turbines we can help with our capabilities and tools

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Who approves the repair - the owner, the OEM or a certification body?
The owner is approving the main shaft repair. But it also depends on which additional repairs have been carried out, means, do they have an influence on the certification or not. Normally if no major change has been made, a new certification is not needed.

Can you do Main shaft repair with our bearings in stock (maybe not SKF brand)?
Yes of course, we can also fit other brands and next time we are happy to also help you with new bearings from SKF. Please remind if your bearings have been in a stock for a longer time, we can also help in doing a visual inspection of the bearings before mounting and if required, polish away corrosion marks etc.

Do you perform gearbox refurbishments at any other facility?
Not directly, we don't do gearbox refurbishment. We only support our customers repairing gearboxes with technical bearing expertise/knowledge for many different gearbox types in the Aftermarket.

Do you turn the main shafts inhouse at the Hamburg facility?
Yes, usually we do the turning of main shafts inhouse at our facility in Hamburg. If the workload of our large size turning machine is exceeded, we must use external supplier in exceptional cases.

If you have any additional questions, please contact us at windenergy@skf.com

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