AZT

ROTOR BALANCING – CONSULTANCY AND WITNESSING OF HIGH SPEED BALANCING

Allianz Center for Technology (AZT)

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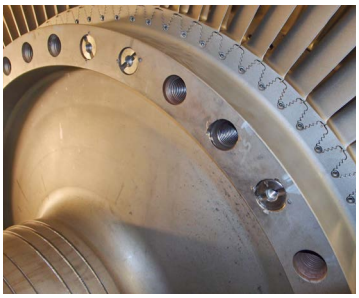
Correct balancing of rotating components is essential to ensure reliable and safe machine operation. Rotor out of balance can result in large centrifugal forces. This can cause high machinery vibration, which can limit usage and life. Especially for high value machinery, such as turbines and generators, balancing quality is essential, when newly installed, overhauled as well as for the whole period of operation.



Steam turbine before installation

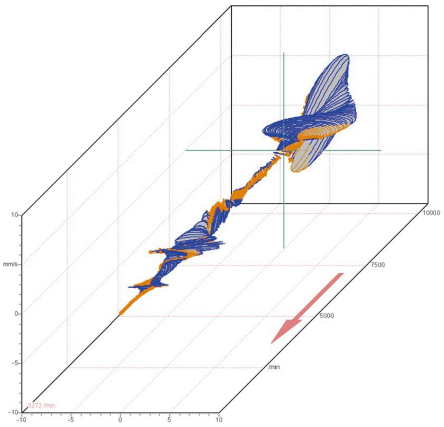
Low speed balancing of compressor rotor

ROTOR BALANCING REQUIRES EXPERT EXPERIENCE

Based on experience from conducting vibration measurements and analysis on a wide range of turbo machinery, AZT engineers can:

- evaluate and witness high speed balancing in facilities (shop balancing)
- provide comprehensive support for in-situ balancing with state-of-the-art measurement equipment

The evaluation of balancing results is based on ISO standards and AZT long-term experience. In the case of deviations, AZT can provide independent advice to solve complex balancing issues and to define the right balancing criteria.
This particularly applies to the special requirements of flexible rotors.



Multi-orbit analysis during run-down

AZT SERVICES ON BALANCING

- Witnessing and evaluation of shop balancing of new and overhauled machinery
- Evaluation of balancing quality according to ISO 21940-1 and ISO 21940-12
- Visual inspection of the rotor before and after balancing
- Consultancy on balancing problems and deviation
- Comprehensive measurement and troubleshooting of vibration issues, including root cause investigation of different sources of unbalance

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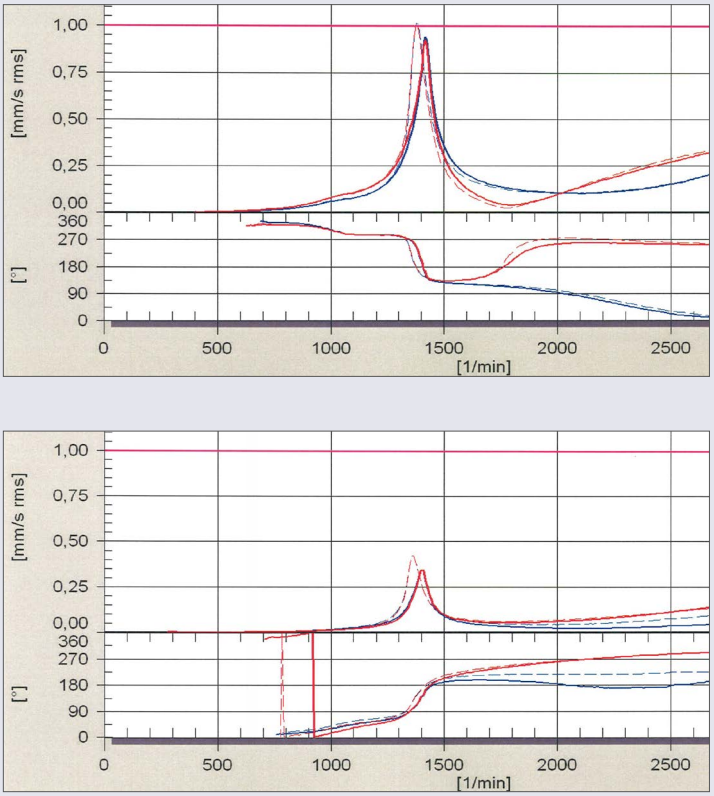
OPTIMIZING THE BALANCING OF A 50 MW INDUCTOR DURING OVERHAUL
→ LEVEL OF VIBRATION COULD BE REDUCED TO APPROXIMATELY ONE QUARTER

Individual machinery design, shaft train arrangement and mounting influence the balancing response. In addition the evaluation of balancing results can become complicated due to various issues such as mounting resonances near nominal speed, shift of critical speeds on the balancing machine, speed dependent hysteresis of unbalance response (e.g. by twisting of blade rows), design dependent settlement of components, thermal influenced rotor behavior, etc.

AZT is prepared to analyze and understand such issues.



Bode plots of 1X vibration vs speed: upper graph inital balancing run, lower graph final balancing run

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YOUR BENEFITS

- ✓ Reliable machinery operation due to independently checked balancing results
- ✓ Independent evaluation and consultancy on balancing issues
- ✓ Troubleshooting cause of out of balance and advice on corrective measures

Find out more about our services and products.

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