AZT

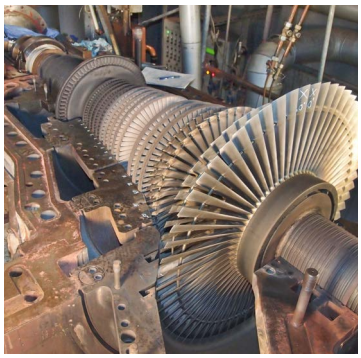
ALLIANZ GLOBAL CORPORATE & SPECIALTY

MACHINERY DIAGNOSTICS AND VIBRATION ANALYSIS SERVICES

Allianz Center for Technology (AZT)

DECEMBER 2018

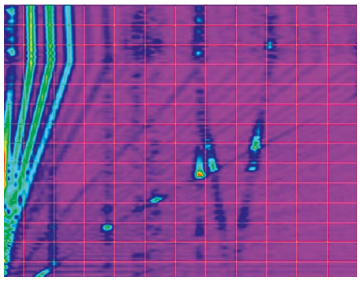
Safe and reliable turbo machinery operation requires adequate vibration levels. To evaluate vibration and its behaviour specific knowledge is needed. For example, at what point do vibrations start to cause damage and where exactly do the different components of vibration come from? These are questions that Allianz Center for Technology (Allianz Zentrum für Technik – AZT) has been asking for more than four decades to assist its clients in analyzing and solving problems caused by vibration.



Open steam turbine

USE OF MACHINERY DIAGNOSTICS TO UNDERSTAND AND SOLVE VIBRATION ISSUES

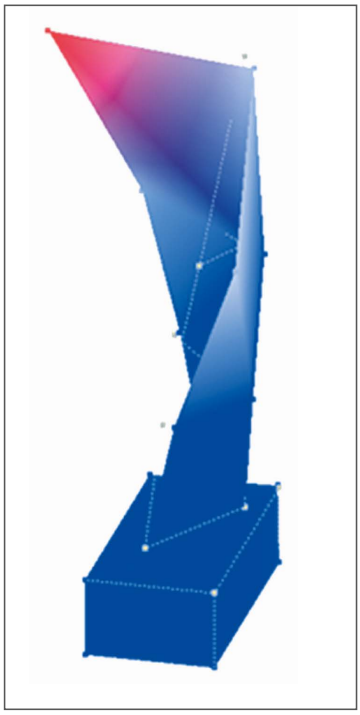
AZT's machinery diagnostics team uses state-of-the-art equipment, such as multi-channel measurement systems, to conduct investigations into the effects of vibrations of rotating equipment, including turbines, compressors, generators and load gears.



Cascade plot of disk vibration during run-up

MONITORING AND ANALYSIS FOR VARIOUS USE CASES:

- **Vibration analysis prior to and after a scheduled overhaul** of turbo sets. The independent analysis and evaluation by AZT is thereby an important measure of quality control. If vibration issues occur during commissioning, AZT is able to analyze it on the basis of the vibration measurements. This helps reduce down times and increase reliability of the turbo set.
- In case of vibration issues, **diagnostic measurements** can be carried out on short notice. Such as: investigation of bearing and shaft vibrations of large turbo sets or industrial turbines, experimental modal analysis and evaluation of resonance frequencies of blades, rotors or structures. On basis on the results the team is able to recommend, monitor and evaluate specific corrective measures.



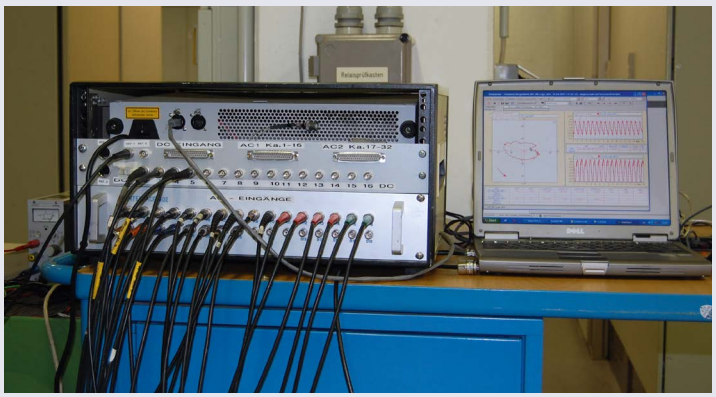
Measurement of blade eigenmode

Allianz

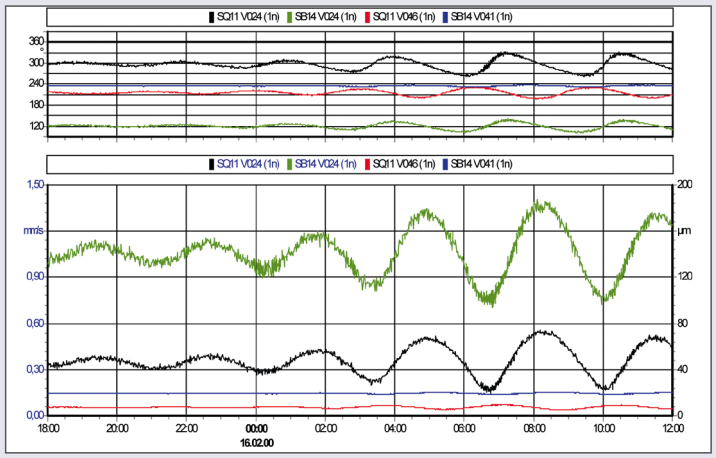
– **Targeted vibration investigation after damages** that can be traced back to vibrations. This vibration investigation is carried out after the machinery has been repaired and is in operation again. Such investigations reveal which operational phases cause the vibrations and help determine what measures must be taken to reduce or altogether eliminate these vibrations.

– **Recommendations for monitoring and safeguarding continual operation.** If necessary, AZT provides measurement equipment to monitor and record the vibration of a turbo set over several months and to evaluate the vibration behavior via remote access.

A selection of AZT equipment and methods:
– Measurement systems with up to 80 channels
– Stand-alone continuous vibration monitoring
– Run-up and run-down analysis
– Frequency analysis
– Modal analysis equipment
– Shaft and bearing vibration - transducers
– Telemetry systems for measurement of shaft torque



AZT multi channel measurement equipment



18hrs vibration trend of turbine rotor which experienced a thermal rotor bow due to rubbing

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YOUR BENEFITS

✓ Independent evaluation of vibration behaviour

✓ Vibration analysis enables establishing the root cause of damages

✓ Specific recommendations on mitigation measures and support on implementation