

Vibration Monitoring at Steam- and Gas-Turbo-Generators for Preparation and Evaluation of Revisions

For the planning of revisions and for the validation of recent actions Ingenieure Prof. Sturm + Partner GmbH offers a complex monitoring of vibration conditions according to the following criterias:

- classification of the absolute values according to ISO 10816 and comparison with the previous year
- classification of the value-fluctuations according to ISO 10816
- examination of the load-dependence
- examination of the revolution shut down curves
- examination of the vibration during shut down
- examination of the vibration-raising because of the warming-up at the machine start

The condition monitoring based on phase-triggered acquisition of bearing housing vibrations at all bearings in three directions with a mobile measurement setup over a defined period of time. With double phase triggers (acquisition of the phase at turbine and generator) a differentiated vector analysis (magnitude and phase) at all measuring points for turbine-induced as well as generator-induced vibrationstimulations is realized. The parallel acquisition of all vibrations makes the calculation and presentation of the movement pattern possible.

With the acquired vibration signals the relevant characteristic values and characteristic functions (e.g. spectra) will be calculated. These characteristics will be examined individual as well as in combination with inspection reports and operating parameters. So it is possible to get detailed information about the actual state of the machine.

By comparing the characteristics with former data or with comparable units it is possible to recognize the developement of various defects or damages (in part at early stage) as well as changes because of revision activities, e.g.:

- unbalance, faulty alignment, lost of blades
- shaft crack, shaft curvature
- rotor touching, oil whip, oil whirl, slide bearing wear
- twisting of housing, displacement of housing, loss of stiffness
- gearing damages

