LOW RESONANCE SPEED BALANCING

Low resonance speed balancing applies to those rotors that cannot be driven to speeds comparable to the nominal speed.

The rotor is being installed on a balancing stand fitted with elastic bearings and driven over the second critical speed.

After stopping the driving, during the slowdown regime, the rotor is going through the resonance regimes of the first two critical speeds of the rotor-bearings assembly.

These two vibration modes are being associated with static and dynamic imbalances.

A graphical method is being utilized for the calculation of the balancing solution.

The measurements are being made with the DSA 550 analyzer fitted with laser displacement and speed sensors.


DSA 550: *5 universal inputs for microphones, accelerometers, proximitors, encoders, and process signals*

The waveform analysis leads to the determination of the two critical speeds and the optimization of the stand adjustments.
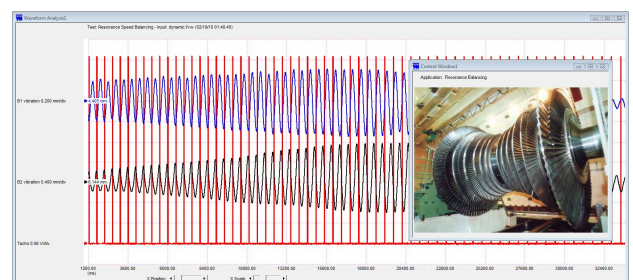

Waveforms of the second critical speed (dynamic regime)

The amplified display of the speed impulses shows the amplitude and phase evolution over each cycle.
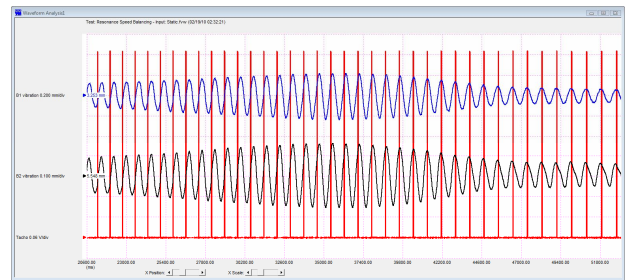

Waveforms of the first critical speed (static regime)

To filter the data, the short-term synchronous FFT analysis is being used. The results correspond to the peak-peak displacements over the fundamental frequencies of the two bearings.
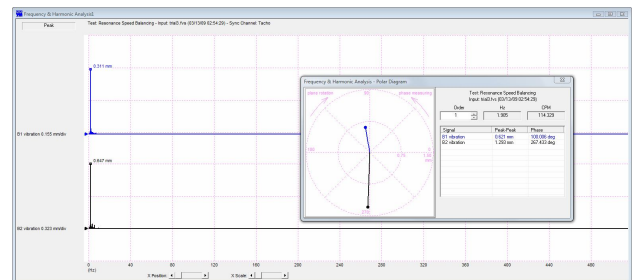
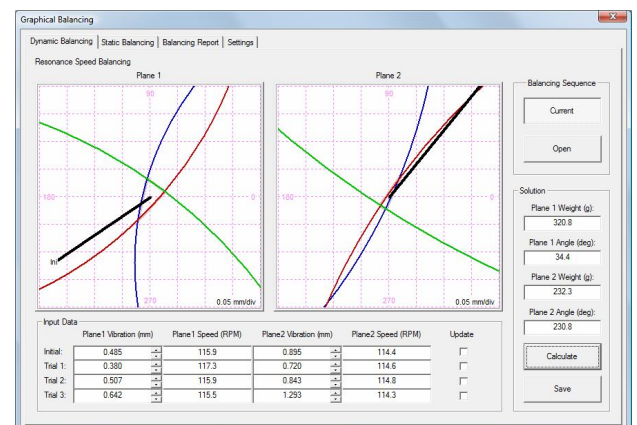*Dynamic regime frequency spectra*

The evolution of the two fundamental components and speed are displayed in the *Parameters Trend* window. The *Graphical Balancing* box calculates the balancing solution starting from the initial values and the three trial start-ups.
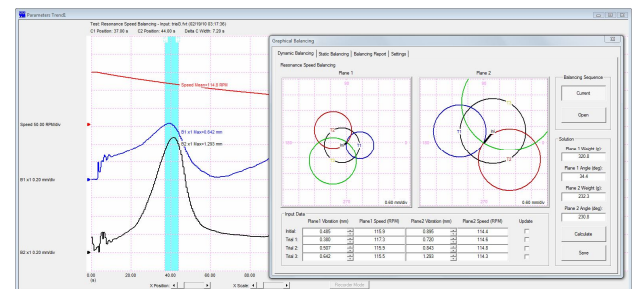
Parameters trend and balancing solution

The input data correctness is being checked through the graphical display of the triangle defined by the intersection of the three circles and the measurements result in the coordinates of its center.

The obtained solution is recorded in a proprietary or an Excel format and used for the balancing process optimization or generation of the report.

Input data verification