CoDiS Computerized Diagnostic System

Hydro generator monitoring system

AN06-HG-UNDERSTANDING THE RUN OUT COMPENSATION MONITORING

Guide bearings taks is to ensure stable dynamic and static behavior of the rotor in all operating conditions. Therefore monitoring the oil film inside the bearing is the most important part of the vibration monitoring. Oil film consistency and stiffness is critical in defining the machine dynamics alongside the masses involved in the rotor vibrations.

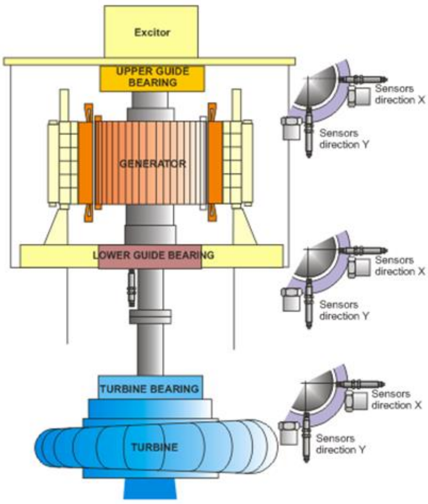
CoDiS (Computerized Diagnostic System) vibration module is equipped with automatic Real time analysis of machine operating conditions enabling the storage of data in normal operation, transient conditions and in Slow roll. The latest is important to detect the shaft centerline geometry also known as Run Out.

REAL TIME ANALYSIS:

Every guide bearing plane is equipped with two proximity probes placed in mutually perpendicular directions. This is a standard defined method for tracking the relative movement of shaft within the bearing. The shaft is rotating but also vibrating creating the orbital movement which is then represented through the orbit plots. The precessional or orbital movement of the shaft is influenced by:

- Shaft Run Out or geometry of the shaft centreline
- Dynamic properties which manifest through vibrations of rotor and shaft

To be able to distinguish between the two it is important to have the Run Out compensation as a part of the monitoring system.

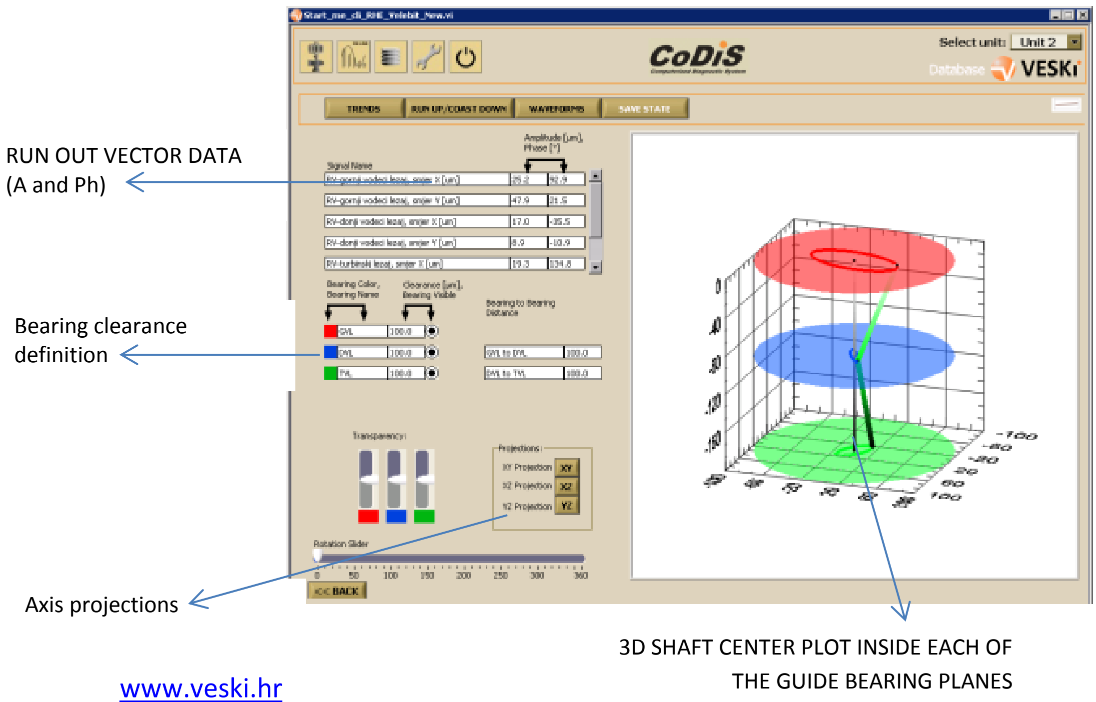


RUN OUT VECTOR COMPENSATION AND ANALYSIS

CoDiS system enables the Run out vector detection and compensation. Run out vector is S1n Amplitude of relative shaft vibrations recorded in Slow roll where no dynamic forces are influencing the shaft movement in rotation.

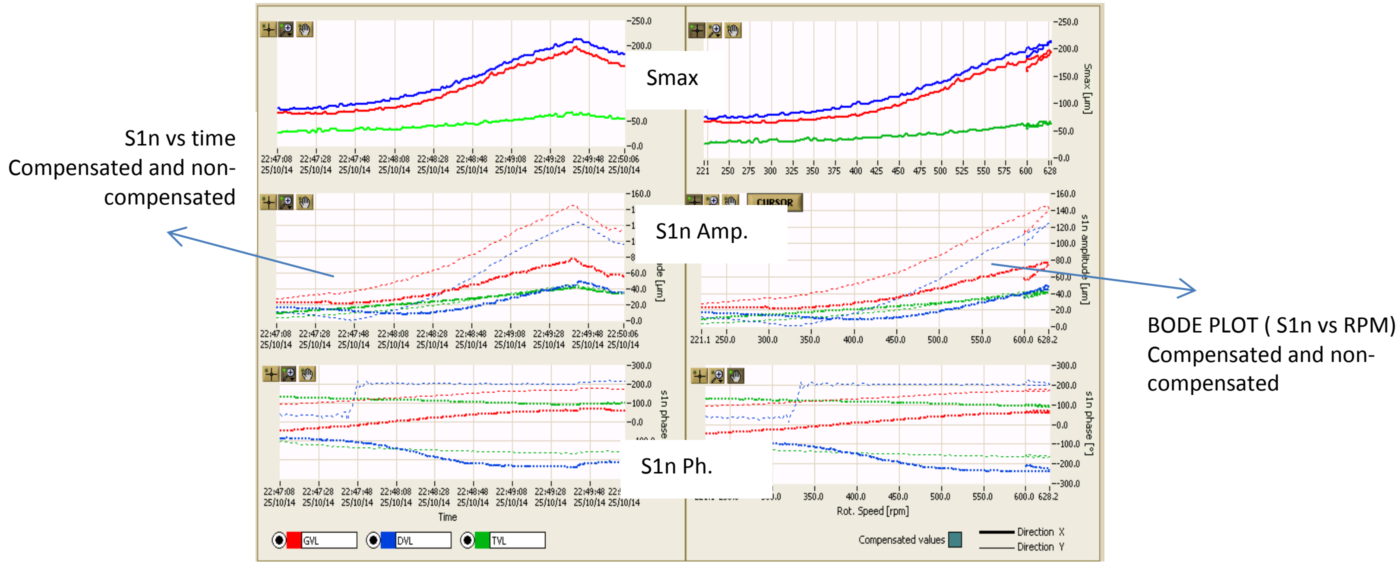
This slow roll vector represents the shaft geometry offset from ideal center and can be compensated when analysing the machine dynamics.

3d Run Out vector plot

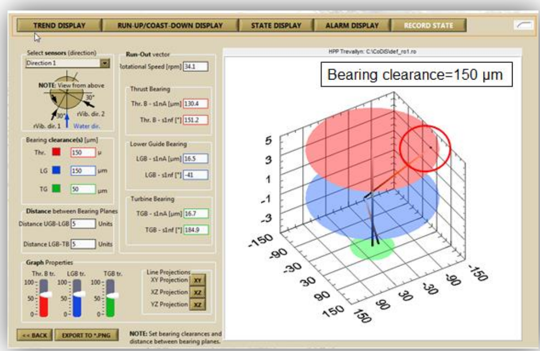


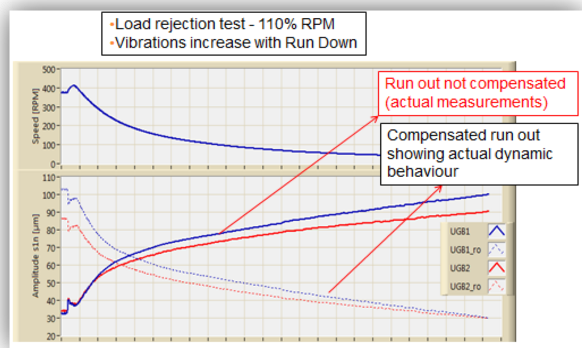
Run Out vector compensation

CoDiS Run out vector compensation can be performed on actual recorded signal and analysis results can be displayed for comparison represented as Bode plots (S1n A and Ph vs RMP). This enables the end user to determine the true dynamical response as sometimes the Run Out vector can have a significant influence on overall measurements.



Practical Example - 3 guide bearings 55MW-Pelton – 375 RPM





Vector analysis