

CoDiS Computerized Diagnostic System

Hydro generator monitoring system

AN05-HG-UNDERSTANDING THE ORBIT PLOTS

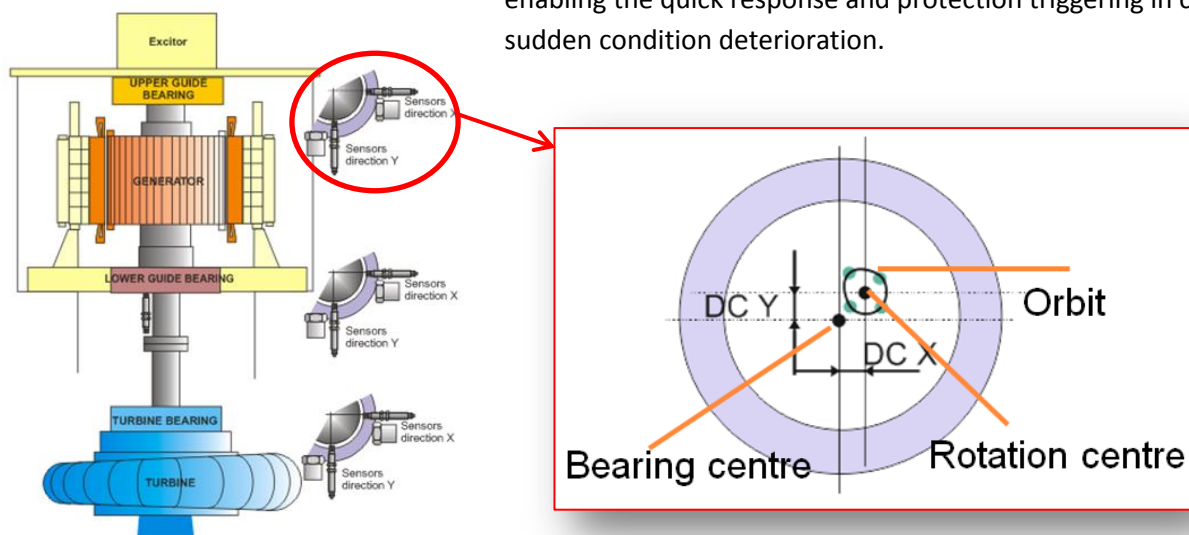
Guide bearings task is to ensure stable dynamic and static behaviour of the rotor in all operating conditions. Therefore monitoring the oil film inside the bearing is the most important part of the vibration monitoring on rotating machines.

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 designed to monitor the conditions within the bearing in real time and also to provide the comprehensive diagnostics tools to identify any irregularities or faults that might result in severe damage or loss of production.

REAL TIME ANALYSIS:

Every proximity probe installed on stator will be analysed in real time, on **CoDiS-RT** processing unit enabling the quick response and protection triggering in case of sudden condition deterioration.



Analysis per each proximity probe:

- S_{1n}, S_{2n}, S_{3n} (A & Ph)
- Rest ($S_p - S_{1-3n}$)
- DC (shaft centerline)
- S_{max} (from X and Y probes)
- S_{p-pmax} (from X and Y probes)

ORBIT PLOT:

Orbit plot is XY plot of shaft centerline precession plotted out of two probes measuring in mutually perpendicular directions.

It is representing the dynamical movement of shaft centerline around the static rotation centre within the bearing. Combining the dynamic and static centerline it is possible to track the bearing oil film thickness throughout the various machine operating conditions.

Most important part of the orbit analysis is order tracking in transient operational modes such as run up, field flashing and load increase. It is important to track orbits in all bearing planes simultaneously to obtain the dynamic behaviour from generator to turbine.

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Storage of order vectors (A and Ph) in history trend database enables easy and quick analysis of the most important parameters by simple data trend display over various modes of operations.

POST PROCESS ANALYSIS:

CoDiS system enables the raw data storage and event recording either on alarm or during transient operation. Data can be stored in duration from 2 sec to several minutes ensuring no data is lost.

This enables the adequate post process analysis on raw signals with interactive browsing through the event.

Signal portion can be selected using the time framed window cursors enabling the analysis of one turn to multiple turns depending on the preferences.

