

TECHNICAL TRAINING

Advanced Turbomachinery Diagnostics

Develop your diagnostics experience with turbomachinery hands-on practices and advanced data interpretation for critical rotating machinery.



Scope

- Rotating machinery
- Turbo machinery



Course Duration

5 days
(30 hours)



Availability

- Customer site
- Classroom
- Online (Virtual)



Audience

- CbM engineers
- Vibration analysts
- Rotating equipment engineers



Prerequisites

- Field work awareness
- Turbomachinery experience
- Vibration analysis experience

Learning outcome

- Identify types of forcing frequencies on turbomachinery
- Be familiar with proximity probe transducer systems
- Configure a signal processing setup with slow-roll compensation
- Select proper testing data and plots required for diagnostics
- Perform advanced analysis of turbomachinery malfunctions
- Plan and conduct onsite turbomachinery balancing procedures
- Recommend best O&M solution for turbomachinery correction
- Describe the rotor-bearing system in rotordynamics perspective

What will you learn

- **Turbomachinery Dynamics** – turbomachinery principles – lateral & torsional vibration – thrust position – bearing types & designs – machine train elements – resonances & mode shapes
- **Data Acquisition** – proximity probes – rack-based system overview – output signal processing – instruments limitation & troubleshooting
- **Advanced Signal Processing** – transducer system signal processing – synchronous & asynchronous sampling – system configuration & functions – slow-roll compensation
- **Steady State Data** – timewave plots – half & full spectrum plots – spectrum waterfall plots – shaft orbit plots – direct & filtered data
- **Transient Data** – shaft centerline plots – bode plots – polar plots – spectrum cascade plots – direct & filtered transient data
- **Turbomachinery Malfunctions** – synchronous & non-synchronous whirl – imbalance & rotor bow – preloads & misalignment – rub & looseness – fluid induced instability – shaft crack – torsional vibration
- **Turbomachinery Balancing** – rotor grade evaluation – advanced balancing & complexities – balancing machines & workshop balancing
- **Introduction to Rotordynamics** – what is rotordynamics – purpose of rotordynamics studies – rotor-bearing system modeling – asymmetric (anisotropic) rotor system – modal balancing

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