

## TECHNICAL TRAINING

# Machinery Diagnostics & Vibration Control

*Develop your vibration analysis experience with professional hands-on diagnostics practices and advanced data interpretation for rotating machinery.*



### Scope

- Rotating machinery
- Turbo machinery
- Reciprocating M/C
- Static structures



### Course Duration

5 days  
(30 hours)



### Availability

- Customer site
- Classroom
- Online (Virtual)



### Audience

- CbM engineers
- Vibration analysts
- Rotating equipment engineers



### Prerequisites

- Field work awareness
- Machinery experience
- Vibration analysis knowledge

## Learning outcome

- Identify types of forcing frequencies on rotating machinery
- Select an appropriate data acquisition tool for vibration analysis
- Configure a signal processing setup for reliable vibration data
- How to interpret vibration data through acquired signals
- Perform machinery and structural vibration fault diagnostics
- Plan and conduct field rotor balancing procedures
- Optimize vibration correction solution using vibration control tools
- Ensure an effective CBM and vibration management program

## What will you learn

- **Machinery Dynamics** – machinery principles – degree of freedom – bearings & supports – vibration principles – rotor whirl – forcing frequencies – natural frequencies & resonances
- **Data Acquisition** – absolute & relative vibration – sensors & probes – system selection & design – sensitivity & linearity – calibration
- **Signal Processing** – signal conditioning & digitization – digital signal processing functions – filtering & aliasing – data collector selection – vibration signal configuration – signal faults & loop checks
- **Data Interpretation** – steady state & transient data – timewave form & spectrum analysis – phase analysis – ODS & mode shapes
- **Machinery Malfunctions** – Imbalance – misalignment – looseness – bearing faults – power transmission faults – electrical faults – oil whirl & whip – flow turbulence – reciprocating machines – resonance
- **Vibration Control** – vibration correction types – structural vibration – stiffness & damping control – maintenance considerations – severity evaluation – impact testing & force response functions (FRF)
- **Dynamic Balancing** – heavy & high spot detection – balancing requirements & techniques – balancing evaluation & errors
- **Vibration Program Management** – hierarchy & route development – baseline & statistical alarm setting – failure reporting & program KPIs

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