GLOBAL EXPERTS INSTITUTE FOR TRAINING.
ISO 9001-2008 TRAINING PROVISION CERTIFIED

Maintaining Rotating Equipment - Advanced

Schedule Dates:

Start Date	End Date	Place
18 August 2024	22 August 2024	Ramada Plaza By Wyndham Istanbul City Center

Program Introduction:

Rotating equipment is a term used to denote mechanical components using kinetic energy to move fluids and other process materials. Pumps, compressors, turbines, etc. are some examples of rotating equipment. What does 'predictive maintenance' refer to in this context? Predictive maintenance refers to checking of the condition and performance of an in-service machine to predict when maintenance would be required.

Effective predictive maintenance includes various parameters and types of inspection, such as vibrations, shocks, acoustic emissions, wear debris in oils, etc. Vibration analysis is used to detect anomalies in the normal vibrations expected out of machines to detect damage or probable future damage.

This Zoe training course will empower you with complete knowledge and detailed information about predictive maintenance, specifically vibration analysis, in rotating equipment. Through this course, you will gain the required experience and confidence to drive maintenance of rotating equipment in your organisation, thereby contributing to better machine life and reduced operational and maintenance costs. This, in turn,

Program Objective:

The primary objective of this Masterclass in Rotating Equipment Engineering training course is to empower professionals with—

- ✓ detailed knowledge and information about predictive maintenance, specifically vibration analysis, of rotating equipment
- ✓ the required experience and confidence to successfully drive maintenance initiatives for all rotating equipment in one's organisation, thereby contributing to increased machine life and reduced maintenance costs

- ✓ the exposure and ability to accurately predict time and extent of maintenance through various methods, specifically vibration analysis
- ✓ knowledge of advanced concepts and techniques to conduct predictive maintenance, including those for vibration analysis
- ✓ adequate understanding and skill to interpret analyses results accurately to take appropriate next steps
- ✓ the confidence and knowledge to guide other professionals on performing predictive maintenance accurately
- ✓ the ability to prevent occupational hazards and through timely actions on the wear and tear of machines
- ✓ the knowledge and awareness to conduct all maintenance and inspection activities as per the timelines and methods specified by universally accepted guidelines

Who should attend?

- ➢ Engineers and other team members working with rotating equipment in plants, who need to understand aspects of maintenance of equipment
- ➢ Managers and supervisors overseeing all operations at a plant involving the use of machines and rotating equipment
- ➢ Analysts and maintenance specialists responsible for conducting predictive analyses and scheduling maintenance activities
- ➢ Finance officers and accounts managers responsible for handling finances, including costs for maintenance of the equipment
- ➢ Top management of an organisation who need to understand the importance of predictive maintenance and invest focused attention towards this
- ➢ Compliance and quality managers responsible for ensuring adherence to required standards of quality and operation
- ➢ Any other professional interested in knowing more about predictive maintenance of rotating equipment

Program Outlines

Day One

Module 1 – Categories of Performance Indicators for Rotating Equipment

- Process
- Mechanical
- Electrical
- Control

Module 2 – Benefits of Predictive Maintenance

- Increased efficiency in lowering downtimes
- Mitigated risks by overall security
- Increased ROI in the short- and long-term
- Reduced labour costs
- Reduced equipment costs
- Reduced energy costs
- Reduced wear part inventories
- Greater safety
- Improved quality

Day Two

Module 3 – Methods of Predictive Maintenance

- Infrared thermography
- Ultrasound analysis
- Motor-current signature analysis
- Oil analysis
- Partial discharge monitoring
- Vibration analysis

Module 4 – Tips for Appropriate Predictive Maintenance

- Put safety first
- Create a schedule and stick to it
- Do not wait for failure
- Share responsibilities
- Record everything

Day Three

Module 5 – Hierarchy for Remote Monitoring and Data Analytics

- Field level
- Edge device
- Cloud

Module 6 – Aspects Impacted by Undetected Vibration

- Shaft misalignment and future behaviour of shafts
- Flatness and shape of shaft
- Rotor imbalance
- Fluid-induced instabilities
- Rubbing malfunctions between stationary and rotating parts
- Mechanical looseness
- Gear faults
- Foundation and other mechanical failure issue

Module 7 – Aspects Expressing Vibration Magnitudes

- Displacement
- Velocity
- Acceleration

Day Four

Module 8 – Types of Imbalances Causing Vibrations

- Static or forced imbalance
- Couple imbalance
- Dynamic imbalance

Module 9 – Instruments Used for Vibration Measurement

- Transducers
    - Accelerometers
    - Velocity transducers
    - Displacement transducers
- FFT analysers
- Line and protection systems

Day Five

Module 10 – Some Types of Vibration Analyses

- Modal analysis
- Orbital analysis
- Torsional analysis

Module 11 – Faults Identified by Vibration Analysis

- Machine imbalance
- Machine misalignment
- Resonance
- Bent shafts
- Gear mesh disturbances
- Blade pass disturbances
- Vane pass disturbances

- Recirculation and cavitation
- Motor faults
- Bearing failures
- Mechanical looseness
- Critical machine speeds

Module 12 – Tips for Cleaning Rotating Equipment

- Cleaning is key
- Ensure proper alignment
- Listen for unusual sounds
- Feel for unusual vibrations
- Keep equipment lubricated
- Check all bolts

Training Methodology:

- Slide presentations
- Interactive discussion
- Simulations and Gamification
- Online Video material

Cost Quotation in Kuwaiti Dinars

The total cost includes:

- Instructor(s) expenses
- Training materials
- Certification
- Lunch Included

Total Cost: 1500 KD per Participant
(One Thousand Five Hundred Kuwaiti Dinar)