XCELERATE TRAINING INSTITUTE

your learning & development partner

MECHANICAL ENGINEERING

# Advanced Rotating Equipment Engineering Training Course

| DURATION | LANGUAGE | FORMAT |
|---|---|---|
| 5 days | English | Classroom / Online |

## Upcoming dates

| Dates | Venue | Format | Fee |
|---|---|---|---|
| 17 – 21 ???? 2027 | Live online | Online (live) | €1?200 |
| 22 – 26 ?????? 2027 | Live online | Online (live) | €1?200 |
| 27 – 31 ?????? 2027 | Istanbul | Classroom | €4?800 |

### Register or ask a question

Online: x8ti.com/course/advanced-rotating-equipment-engineering-training-cou…

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# Advanced Rotating Equipment Engineering Training Course

## Introduction

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 Xcelerate Training Institute 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 organization, thereby contributing to better machine life and reduced operational and maintenance costs.

Learning Objectives

- 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 organization, 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

Training Methodology

Xcelerate Training Institute follows an unconventional and unique approach to training, ensuring that the training method is both theoretical and practical. Lectures are delivered by highly experienced professionals. Two-way participation is encouraged through role-plays, sample assignments, etc.

Trainees are also encouraged to share experiences and issues related to the topic with the rest of the audience, and these are discussed to relate theory to practical scenarios and challenges.

Benefits for You

- More accurate predictive maintenance for rotating equipment by trained and experienced professionals
- Greater machine life and reduced maintenance costs
- Higher quality product because of better machine maintenance
- Lesser downtime and hence lesser risks and losses to business
- More regular inspections and audits for compliance with international standards
- Prevention of occupational hazards and challenges through accurate predictions and timely action
- Continuous training of employees on maintenance of equipment to prevent early wear and tear
- Organizational development because of reduced costs and better equipment
- Increased return on investment because of the higher efficiency of machines
- Greater safety to employees, thus promoting the organization as an employer of choice

Benefits for You

- In-depth understanding and information about predictive maintenance of rotating equipment, specifically vibration analysis
- Increased knowledge of advanced concepts and techniques for predictive maintenance to ensure more accurate results and timely action
- Greater awareness and knowledge of acceptable standards of maintenance and operation, thereby ensuring that all activities and operations comply with these standards
- Better understanding and greater confidence to mentor other professionals on effective predictive maintenance of rotating equipment
- Greater ability and knowledge to contribute to reduced organizational costs through regular maintenance of equipment, thereby ensuring better quality at lower costs
- Increased experience and skill to ensure overall employee safety through early detection of possible challenges and timely action for these
- Enhanced skill set and capabilities to oversee all predictive maintenance activities for the organization, specifically vibration analysis, by drawing relevant conclusions from available data
- Enhanced skill set and potential to assume higher roles and responsibilities related to predictive maintenance of equipment in any industry, thus increasing opportunities for growth and progression

Who Should Attend?

- Engineers and other team members working with rotating equipment in plant 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 organization 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

Course Outline

Categories of Performance Indicators for Rotating Equipment

- Process
- Mechanical
- Electrical
- Control

Benefits of Predictive Maintenance

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

Methods of Predictive Maintenance

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

Tips for Appropriate Predictive Maintenance

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

Hierarchy for Remote Monitoring and Data Analytics

- Field level
- Edge device
- Cloud

Aspects Impacted by Undetected Vibration

- Shaft misalignment and future behavior 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

Aspects Expressing Vibration Magnitudes

- Displacement
- Velocity
- Acceleration

Types of Imbalance Causing Vibrations

- Static or forced imbalance
- Couple imbalance
- Dynamic imbalance

Instruments Used for Vibration Measurement

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

Some Types of Vibration Analyses

- Modal analysis
- Orbital analysis
- Torsional analysis

Faults Identified by Vibration Analysis

- Machine imbalance
- Machine misalignment
- Resonance
- Bent shafts
- Gear mesh disturbances

- Blade pass disturbances
- Vane pass disturbances
- Re-circulation and cavitation
- Motor faults
- Bearing failures
- Mechanical looseness
- Critical machine speeds

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

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# Registration Form

## Advanced Rotating Equipment Engineering Training Course

Preferred dates: ..... Venue or online: .....

Duration: 5 days Language: .....

Please complete and email this form to us, or register online. We confirm your place and send the invoice within one working day.

### Delegate information

Full name (Mr / Ms / Dr / Eng): .....

Position: ..... Telephone / mobile: .....

Official email: ..... Personal email: .....

### Company information

Company name: .....

Address: .....

City / country: ..... VAT / tax number: .....

### Person responsible for training & development

Full name (Mr / Ms / Dr / Eng): .....

Position: ..... Telephone / mobile: .....

Email: .....

### Payment

☐ Please invoice me ☐ Please invoice my company

Signature: ..... Date: .....

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