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COURSE BROCHURE

# Condition-Based Maintenance Strategy for Rotating Machinery Training Course

15 – 19 August 2027
Sharm El-Sheikh

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# Condition-Based Maintenance Strategy for Rotating Machinery Training Course

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Condition-Based Maintenance Strategy for Rotating Machinery is a 1-week training course for maintenance planners, reliability engineers and maintenance supervisors who decide how pumps, compressors, fans, gearboxes and turbines are watched for early signs of distress, and who leave with a rotating machinery monitoring strategy for one production train. Leaner crews and cheaper sensors now push organisations to replace calendar overhauls with evidence from the machine itself. Jupiter Prime Training delivers this subject with a reliability engineer's view of rotating plant.

## Why Condition-Based Maintenance Strategy Matters Now

Three forces reshape how rotating plant is maintained. Wireless accelerometers and online oil sensors have fallen in cost, so the question is which machines and signals justify monitoring. Experienced vibration analysts are scarce, so routes and alarm limits must be designed for technicians to run. Operations managers expect longer runs between planned stops on critical trains. An organisation that matches technology to failure mode catches bearing, seal and alignment defects weeks ahead; one that buys sensors without a strategy drowns in alarms. The course draws on the asset management system requirements of ISO 55001.

## Who Gains Most from Condition-Based Maintenance Strategy

- Engineers responsible for the reliability of pump, compressor and turbine fleets
- Planners who turn monitoring findings into corrective work orders and shutdown scopes
- Supervisors who run vibration, lubricant sampling and thermal imaging routes
- Specialists who interpret spectra, wear debris and temperature trends
- Engineers who set criticality rankings and spares holdings for rotating plant

A site reliability group gains most when its engineer, planner and route supervisor attend together and agree one monitoring logic.

## Condition-Based Maintenance Strategy Capabilities

Participants learn to link each rotating machine's failure behaviour to the signal that reveals it first.

- Rank rotating machines by consequence of failure — where monitoring money goes first
- Match vibration, oil, thermography and ultrasound to failure modes — technology purchase decisions
- Specify alarm and trip limits for each monitored point — technicians and control room operators
- Calculate inspection frequency from the warning period of each defect — route planners

- Design a fault-to-work-order workflow in the maintenance system — supervisors and schedulers
- Build a cost-benefit case for online versus portable monitoring — plant management

## Key Condition-Based Maintenance Strategy Terms

- Condition-based maintenance — work triggered by measured evidence of deterioration rather than by elapsed time or running hours.
- P-F interval — the time between a detectable potential failure and functional failure, which sets how often a machine must be checked.
- Vibration spectrum — a plot of vibration amplitude against frequency that separates imbalance, misalignment, looseness and bearing defects.
- Wear debris analysis — examination of particles in lubricant to show which component is wearing and how fast.
- Alarm limit — a measured value at which a machine is flagged for closer attention before damage escalates.
- Machine criticality — a ranking of rotating equipment by the safety, production and repair consequence of its failure.

## Condition-Based Maintenance Strategy Day by Day

## Day 1: Rotating Plant Failure Behaviour

- Criticality Ranking Matrix — Which Machines Deserve Monitoring First
- Bearing, Seal and Coupling Failure Modes — Defects Worth Detecting Early
- P-F Curve for Rotating Equipment — Setting Detection Windows
- Failure History Review From Work Orders — Separating Chronic From Random Faults
- Run-to-Failure Versus Monitored Strategy — Choosing Per Machine Class

## Day 2: Vibration and Ultrasound Techniques

- Overall Velocity and Spectrum Trending — Detecting Imbalance and Misalignment
- Envelope and Demodulation Methods — Early Rolling Element Bearing Faults
- Airborne and Contact Ultrasound — Lubrication Starvation and Valve Leakage
- Measurement Point Selection and Mounting — Repeatable Readings on Each Machine
- Online Versus Portable Data Collection — Matching Coverage to Criticality

## Day 3: Lubricant and Thermal Evidence

- Oil Sampling Points and Frequencies — Representative Samples From Gearboxes
- Particle Count, Viscosity and Water Content — Lubricant Condition Decisions
- Ferrography and Wear Metals — Locating the Wearing Component
- Infrared Thermography of Motors and Couplings — Overheating and Misalignment Clues
- Motor Current Signature Checks — Rotor Bar and Electrical Faults

## Day 4: Limits, Routes and Work Flow

- Statistical and Standard-Based Alarm Limits — Reducing False Alarms
- Route Design and Inspection Frequency — Labour Hours Versus Detection Risk
- Fault Report to Work Order Workflow — Planning Corrective Jobs Before Breakdown
- Monitoring Performance Indicators — Catch Rate, Avoided Failures and Backlog
- Cost-Benefit Case for Monitoring Technology — Funding Sensors and Software

## Day 5: Practising the Rotating Machinery Monitoring Strategy

- Technology-to-Failure-Mode Matrix for a Pump Train — Applying Days 1 to 3
- Alarm Limits and Routes for a Compressor Package — Applying Day 4
- Case Review From Petrochemical and Water Utility Plants — Lessons on Missed Faults
- Rollout Sequence Across Production Trains — Resourcing Analysts and Technicians
- Rotating Machinery Monitoring Strategy — Final Document for Site Approval

## Applying Condition-Based Maintenance Strategy After the Course

- Build a technology-to-failure-mode matrix for the ten most critical rotating machines on site.
- Review existing vibration alarm limits against actual trend data and remove repeat false alarms.

## Condition-Based Maintenance Strategy Questions FAQ

### What is condition-based maintenance strategy for rotating machinery and why does it matter now?

It is the practice of deciding which pumps, compressors and turbines to monitor, with which technique and how often. It matters now because sensors are cheaper, skilled analysts are scarce and plants expect longer runs between stops.

### Which roles gain most from condition-based maintenance strategy for rotating machinery?

Reliability engineers, maintenance planners and route supervisors gain most. You set criticality, choose techniques and turn findings into planned work.

### How does a condition-based maintenance strategy course differ from a preventive task interval course?

It concentrates on rotating machinery and predictive technologies. A course on preventive task intervals covers time-based job lists across all equipment, while this one selects vibration, oil, thermal and ultrasonic evidence for each machine class.

## What do you bring back from condition-based maintenance strategy training for rotating machinery?

You bring back a monitoring strategy for one production train. It lists criticality, watched failure modes, techniques, frequencies and alarm limits for each machine.

## Condition-Based Maintenance Strategy: The Way Forward

The rotating machinery monitoring strategy first informs which machines receive online sensors and which stay on portable routes. Reliability engineers own it, planners use its fault-to-work-order flow and supervisors run its routes. After the first six months of readings, the alarm limits and inspection frequencies deserve a second look against the faults caught and missed.