5-Day Cement Industry Training Course
In

RELIABILITY MAINTENANCE MANAGEMENT IN CEMENT INDUSTRY

Dubai - UAE, 27 Apr. – 01 May 2026

COURSE LEVEL: ADVANCED

COURSE OVERVIEW:

Reliability Maintenance Management is the strategic approach to ensuring that massive cement plant assets operate at peak performance with minimal unplanned interruptions. This course defines the shift from reactive "breakdown" cultures to proactive "Reliability-Centered" strategies. It provides a comprehensive toolkit for managing the lifecycle of kilns, mills, and complex conveying systems through advanced diagnostic and planning techniques.

The scope of this training involves the implementation of Reliability-Centered Maintenance (RCM) and Total Productive Maintenance (TPM) specifically adapted for the harsh environments of cement production. It covers the use of Predictive Maintenance (PdM) technologies, such as vibration analysis, thermography, and oil tribology, to detect failures before they occur. Furthermore, the course addresses the management of "Major Overhauls," focusing on the critical path analysis and resource optimization required during annual shutdowns.

Coverage includes detailed modules on "Failure Mode and Effects Analysis" (FMEA), "Root Cause Failure Analysis" (RCFA), and the optimization of spare parts inventory. Participants will explore the role of the Maintenance Planner and the integration of Computerized Maintenance Management Systems (CMMS). Through the study of asset criticality and precision maintenance, attendees will gain the skills necessary to increase plant availability, extend equipment life, and significantly reduce operational maintenance costs.

COURSE OBJECTIVES:

After completion of this course, the participants will be able to:

- Apply "Reliability-Centered Maintenance" (RCM) principles to plant assets.
- Conduct a "Failure Mode and Effects Analysis" (FMEA) for a kiln line.
- Utilize Predictive Maintenance (PdM) tools to monitor equipment health.
- Lead a "Root Cause Failure Analysis" (RCFA) to prevent repeat breakdowns.
- Optimize "Preventive Maintenance" (PM) schedules to reduce over-maintenance.
- Manage "Strategic Spare Parts" based on asset criticality and lead times.
- Plan and execute "Major Annual Overhauls" using CPM/PERT techniques.
- Implement "Total Productive Maintenance" (TPM) on the shop floor.
- Use CMMS data to track Maintenance KPIs (MTBF, MTTR).
- Analyze "Lifecycle Costs" (LCC) for new equipment procurement.

- Establish a "Lubrication Excellence" program for heavy machinery.
- Evaluate the performance of maintenance contractors and service providers.

TARGET AUDIENCE:

This course is intended for Maintenance Managers, Reliability Engineers, Mechanical/Electrical Supervisors, and Maintenance Planners.

TRAINING COURSE METHODOLOGY:

A highly interactive combination of lectures, discussion sessions, and case studies will be employed to maximize the transfer of information, knowledge, and experience. The course will be intensive, practical, and highly interactive. The sessions will start by raising the most relevant questions and motivating everybody to find the right answers. The attendants will also be encouraged to raise more of their questions and to share in developing the right answers using their analysis and experience. There will also be some indoor experiential activities to enhance the learning experience. Course material will be provided in PowerPoint, with necessary animations, learning videos, and general discussions.

The course participants shall be evaluated before, during, and at the end of the course.

COURSE CERTIFICATE:

National Consultant Centre for Training LLC (NCC) will issue an Attendance Certificate to all participants completing a minimum of 80% of the total attendance time requirement.

COURSE OUTLINE / COURSE CONTENT:

MODULE 1: PRINCIPLES OF RELIABILITY MANAGEMENT

- Evolution of Maintenance: From Reactive to Proactive.
- Understanding the "P-F Interval" and the failure curve.
- Introduction to "Reliability-Centered Maintenance" (RCM) logic.
- Key differences between "Availability," "Reliability," and "Maintainability."
- Safety and environmental impact of maintenance failures.

MODULE 2: ASSET CRITICALITY AND MAINTENANCE STRATEGY

- Developing an "Asset Hierarchy" for the cement plant.
- Ranking equipment based on production and safety impact.
- Selecting the right strategy: Run-to-Failure vs. PM vs. PdM.
- "Zero-Based" maintenance budgeting and resource allocation.
- Role of the "Maintenance Steering Committee."

MODULE 3: PREDICTIVE MAINTENANCE (PDM) TECHNOLOGIES

- Vibration Analysis: Detecting bearing and gear failures.
- Infrared Thermography: Monitoring electrical and kiln shell heat.
- Oil Analysis and Tribology: Identifying internal wear and contamination.
- Ultrasound Detection: Finding air leaks and electrical discharge.

- Motor Current Signature Analysis (MCSA) for large drives.

MODULE 4: ROOT CAUSE FAILURE ANALYSIS (RCFA)

- The "5 Whys" and "Fishbone Diagram" (Ishikawa) techniques.
- Identifying "Physical," "Human," and "Latent" root causes.
- Data collection: Preserving "Failed Parts" and "Operational Trends."
- Developing and tracking "Corrective Action Plans."
- RCFA case study: Analysis of a major kiln gearbox failure.

MODULE 5: FAILURE MODE AND EFFECTS ANALYSIS (FMEA)

- Defining "Functional Failures" for complex systems.
- Identifying "Failure Modes" and their effects on production.
- Calculating the "Risk Priority Number" (RPN).
- Developing "Mitigation Tasks" based on FMEA findings.
- Practical exercise: FMEA for a Vertical Roller Mill (VRM).

MODULE 6: MAINTENANCE PLANNING AND SCHEDULING

- Role of the Maintenance Planner vs. Maintenance Supervisor.
- Managing the "Work Order" lifecycle in the CMMS.
- Backlog management and "Ready-to-Execute" scheduling.
- Estimating "Man-hours," "Tools," and "Materials" for tasks.
- Measuring "Shedding Compliance" and "Labor Productivity."

MODULE 7: MAJOR OVERHAUL AND SHUTDOWN MANAGEMENT

- The "Shutdown Lifecycle": Preparation, Execution, and Close-out.
- Using "Critical Path Method" (CPM) for kiln and mill overhauls.
- Managing "Safety and Quality" during high-pressure shutdowns.
- Daily "Progress Tracking" and "Resource Leveling."
- Post-shutdown review and "Lessons Learned" documentation.

MODULE 8: LUBRICATION EXCELLENCE AND CONTAMINATION CONTROL

- Developing a "Plant-wide Lubrication Map."
- Selection of oils and greases for high-temperature/high-load.
- "Contamination Control": Proper storage and dispensing.
- Automatic lubrication systems: Operation and maintenance.
- Impact of "Precision Lubrication" on bearing life.

MODULE 9: SPARE PARTS AND INVENTORY OPTIMIZATION

- Categorizing "Insurance Spares" vs. "Consumables."
- Setting "Minimum/Maximum" levels and "Reorder Points."
- Managing "V-Link" and "Consignment" stock with suppliers.
- Technical auditing of spare parts quality (Bearings, Gears).
- Warehouse management: 5S and preservation of parts.

MODULE 10: TOTAL PRODUCTIVE MAINTENANCE (TPM) AND CULTURE

- The 8 Pillars of TPM in an industrial environment.
- "Autonomous Maintenance": Training operators in basic care.
- "Clean, Lubricate, Inspect, and Tighten" (CLIT) standards.
- Overcoming "Cultural Barriers" to reliability.
- Final exam and Reliability Improvement Plan workshop.