مركز المستشار الوطني للتدريب
National Consultant Centre For Training
YOUR GATE TO HANDS-ON TRAINING

5-Day Cement Industry Training Course
In

MATERIAL HANDLING IN THE CEMENT INDUSTRY

Dubai - UAE, 05 – 09 Oct. 2026

COURSE LEVEL: INTERMEDIATE

COURSE OVERVIEW:

Material handling represents the logistical backbone of cement manufacturing, involving the movement of massive volumes of raw materials, intermediates, and finished products across various process stages. This course defines the mechanical and operational principles required to transport materials from the quarry to the packing plant with minimal loss and maximum efficiency. It establishes the critical link between equipment reliability and the continuous flow of the production line.

The scope of this training encompasses the technical specifications and maintenance protocols for a wide array of industrial conveyors, elevators, and storage systems. It covers the physics of bulk material behavior, including flowability, abrasiveness, and moisture impact, which dictate equipment selection and wear management. Furthermore, the course addresses the integration of automated weighing and feeding systems that ensure precise chemical dosing for the kiln and mills.

Coverage includes detailed modules on belt conveyor safety, bucket elevator troubleshooting, pneumatic conveying technologies, and the operation of stackers and reclaimers. Participants will explore strategies for dust mitigation at transfer points and the implementation of spillage control measures to maintain environmental standards. Through the study of lifecycle management for handling assets, attendees will gain the expertise to reduce operational downtime and optimize the energy consumption of transport systems.

COURSE OBJECTIVES:

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

- Identify the mechanical components and functions of all major material handling assets.
- Explain the criteria for selecting specific transport systems based on material properties.
- Optimize the efficiency of belt conveyors through proper tensioning and alignment.
- Troubleshoot common bucket elevator failures and implement preventive measures.
- Manage pneumatic conveying systems to prevent blockages and pipe erosion.
- Understand the operation and maintenance of stacker and reclaimer systems.
- Calculate the volumetric and mass flow rates for different handling equipment.
- Implement advanced dust suppression and collection techniques at transfer points.
- Conduct comprehensive safety audits for all material handling installations.
- Evaluate the performance of weigh feeders and flow meters for accuracy.
- Develop a proactive maintenance schedule for bearings, drives, and belts.

- Reduce material spillage and waste through improved chute and scraper design.

TARGET AUDIENCE:

This course is intended for Maintenance Engineers, Mechanical Supervisors, Production Operators, Quarry Managers, and Logistics Coordinators.

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: BULK MATERIAL CHARACTERISTICS

- Classification of materials: Raw meal, clinker, coal, and cement.
- Analysis of particle size distribution and bulk density.
- Impact of moisture and temperature on material flowability.
- Assessing material abrasiveness and its effect on equipment wear.
- Chemical compatibility of materials with transport linings.

MODULE 2: BELT CONVEYOR TECHNOLOGY

- Components of a conveyor system: Belts, idlers, and pulleys.
- Drive systems and soft start mechanisms for long conveyors.
- Belt tensioning devices and take-up unit maintenance.
- Safety devices: Pull cords, belt sway switches, and speed monitors.
- Troubleshooting belt tracking issues and joint failures.

MODULE 3: BUCKET ELEVATORS FOR VERTICAL TRANSPORT

- Centrifugal vs. continuous discharge elevators.
- Chain type vs. belt type elevators: Selection criteria.
- Monitoring systems for belt slip and bucket detachment.
- Maintenance of drive sprockets and traction wheels.
- Safe procedures for cleaning and inspecting elevator casings.

MODULE 4: PNEUMATIC CONVEYING SYSTEMS

- Principles of lean phase vs. dense phase conveying.
- Components of a pneumatic system: Blowers, feeders, and pipelines.
- Managing air-to-solids ratios for energy efficiency.
- Troubleshooting pipeline blockages and air leakage.
- Maintenance of rotary airlocks and diverter valves.

MODULE 5: SCREW CONVEYORS AND AIR SLIDES

- Mechanical design of screw flights and trough systems.
- Applications of air slides for raw meal and cement transport.
- Maintenance of aeration fabrics and blower units.
- Calculating capacity and power requirements for screw drives.
- Managing dust seals and bearing protection in air slides.

MODULE 6: STACKERS AND RECLAIMERS

- Role of pre-blending yards in chemical homogenization.
- Circular vs. longitudinal stacking and reclaiming methods.
- Maintenance of bucket wheels and luffing/slewing drives.
- Automation and anti-collision systems in the storage yard.
- Optimizing the blending ratio through stacking patterns.

MODULE 7: FEEDING AND WEIGHING SYSTEMS

- Operation of gravimetric weigh feeders and flow scales.
- Calibration procedures for ensuring dosing accuracy.
- Troubleshooting load cell failures and electronic drift.
- Managing bin activators and vibratory feeders.
- Integration of feeding data into the plant DCS.

MODULE 8: SILO STORAGE AND EXTRACTION

- Design of storage silos for raw meal, clinker, and cement.
- Extraction methods: Fluidized bottoms and mechanical reclaimers.
- Preventing material segregation and "rat-holing" in silos.
- Safety protocols for silo entry and high-level alarms.
- Level measurement technologies: Ultrasonic, radar, and laser.

MODULE 9: DUST CONTROL AND SPILLAGE MANAGEMENT

- Design of transfer chutes for minimized impact and dust.
- Selection and maintenance of primary and secondary belt scrapers.
- Sealing systems for skirt boards and loading zones.
- Role of insertable bag filters in material handling.
- Environmental impact of material loss and mitigation strategies.

MODULE 10: MAINTENANCE AND RELIABILITY OF HANDLING ASSETS

- Lubrication management for conveyor bearings and gearboxes.

- Non-destructive testing (NDT) of shafts and drive components.
- Predictive maintenance using vibration and temperature analysis.
- Strategic spare parts management for critical conveyors.
- Developing "Standard Operating Procedures" for handling repairs.