5-Day Cement Industry Training Course
In

BELT CONVEYOR MAINTENANCE AND SAFETY

Abu Dhabi - UAE, 08 – 12 June 2026

COURSE LEVEL: BASIC TO INTERMEDIATE

COURSE OVERVIEW:

Belt conveyors are the lifeline of material handling in the cement and mining industries, moving massive volumes of raw materials and finished products daily. This course defines the mechanical architecture of conveyor systems and the critical importance of regular maintenance to prevent costly downtime. By understanding the interaction between the belt, idlers, pulleys, and drives, participants will learn how to maintain a reliable and efficient transport system.

The scope of this training includes a detailed analysis of conveyor components, from the rubber belt composition to the structural frame and tensioning devices. It covers the common causes of belt wear, mistracking, and spillage, providing practical solutions for troubleshooting. Furthermore, the course places a heavy emphasis on safety, as conveyors are one of the most hazardous areas in an industrial plant if not properly guarded and maintained.

Coverage includes best practices for belt splicing, idler replacement, and pulley lagging. Participants will explore the latest technologies in conveyor monitoring, such as belt rip detection and speed sensors. The program also addresses the environmental aspects of conveying, focusing on dust suppression and spillage control. Through hands-on demonstrations and safety drills, attendees will gain the skills necessary to operate and maintain conveyor systems while strictly adhering to occupational health and safety standards.

COURSE OBJECTIVES:

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

- Identify all major components of a belt conveyor system and their functions.
- Explain the different types of conveyor belts and their material properties.
- Perform routine inspections to identify early signs of belt wear and damage.
- Troubleshoot and correct belt mistracking and alignment issues.
- Describe the procedures for safe belt splicing and mechanical fastening.
- Maintain pulleys, idlers, and scrapers for optimal material cleaning.
- Identify and mitigate the risks of fire and dust explosions on conveyors.
- Implement effective lubrication schedules for conveyor bearings and drives.
- Understand and apply Lock-out Tag-out (LOTO) procedures for conveyors.
- Install and test safety devices like pull cords and emergency stops.
- Reduce material spillage and dust generation at transfer points.
- Conduct a comprehensive risk assessment for conveyor maintenance tasks.

TARGET AUDIENCE:

This course is designed for Maintenance Technicians, Mechanical Fitters, Conveyor Operators, Safety Officers, and Warehouse Supervisors involved in the operation and upkeep of material handling systems.

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: ANATOMY OF A BELT CONVEYOR

- Principles of belt conveying and its industrial importance.
- Detailed breakdown of components: Head, tail, and take-up sections.
- Types of conveyors: incline, decline, and horizontal systems.
- Material characteristics and their impact on conveyor design.
- Introduction to conveyor standards and terminology.

MODULE 2: CONVEYOR BELT TECHNOLOGY

- Construction of the belt: carcass, covers, and reinforcement.
- Comparing textile (EP) belts versus steel cord belts.
- Selecting cover grades for heat, oil, and abrasion resistance.
- Calculating belt tension and the factors affecting belt life.
- Storage and handling of new conveyor belts.

MODULE 3: PULLEYS AND IDLERS MAINTENANCE

- Types of pulleys: drive, snub, bend, and take-up pulleys.
- Importance of pulley lagging for friction and belt protection.
- Idler configurations: carrying, return, and impact idlers.
- Identifying seized idlers and their impact on belt wear.
- Maintenance of bearings and seals in rotating components.

MODULE 4: BELT TRACKING AND ALIGNMENT

- Physics of belt movement: why belts mistrack.
- Techniques for adjusting idlers and pulleys for better tracking.
- Installing and maintaining automatic training idlers.
- Impact of structural misalignment on conveyor performance.
- Step-by-step guide to tracking a new belt.

MODULE 5: SPLICING AND REPAIR TECHNIQUES

- Introduction to hot and cold vulcanized splicing.
- Mechanical fasteners: when and how to use them.
- Tools and equipment required for professional belt splicing.
- Repairing rips, gouges, and edge damage.
- Quality testing and inspection of a finished splice.

MODULE 6: CLEANING AND SPILLAGE CONTROL

- The role of primary and secondary belt scrapers.
- Maintenance and adjustment of scraper blades.
- Design of loading chutes and skirting systems to prevent leaks.
- Impact beds versus impact idlers at loading zones.
- Managing "carry-back" and its effect on conveyor hygiene.

MODULE 7: DRIVE SYSTEMS AND TAKE-UP UNITS

- Electric motors and gear reducers for conveyor drives.
- Understanding fluid couplings and soft-start systems.
- Gravity take-ups versus screw take-ups for tension management.
- Brake systems and backstops for inclined conveyors.
- Lubrication requirements for drive assemblies.

MODULE 8: CONVEYOR SAFETY AND GUARDING

- Identifying "nip points" and dangerous rotating parts.
- Design and installation of effective safety guards.
- Emergency stop systems: pull-wires and limit switches.
- Safe walking ways and overhead protection.
- Fire prevention: heat sensors and flame-retardant belts.

MODULE 9: DUST MANAGEMENT AT TRANSFER POINTS

- Causes of dust generation during material transfer.
- Passive dust control: chute design and stilling zones.
- Active dust suppression: water sprays and misting systems.
- Maintenance of dust extraction hoods and bag filters.
- Environmental regulations regarding material spillage.

MODULE 10: INSPECTION AND CONDITION MONITORING

- Developing a daily, weekly, and monthly inspection checklist.

- Using thermography to detect overheating bearings.
- Belt thickness monitoring and rip detection sensors.
- Ultrasonic testing for idler and pulley health.
- Recording and analyzing conveyor downtime data.

MODULE 11: SAFE WORK PRACTICES AND LOTO

- Detailed Lock-out Tag-out (LOTO) procedures for conveyors.
- Working in confined spaces around conveyor tunnels.
- Safe procedures for removing and installing heavy pulleys.
- Risk assessment for "hot work" near conveyor belts.
- Coordination between maintenance and operations during repairs.

MODULE 12: COURSE CONCLUSION AND ASSESSMENT

- Practical troubleshooting workshop and case studies.
- Final exam on conveyor maintenance and safety.
- Group discussion on improving plant conveyor reliability.
- Course wrap-up and feedback.