

€ TRAINING

Advanced Techniques for Solid Material
Conveyance





Advanced Techniques for Solid Material Conveyance

Introduction:

This training program provides comprehensive instruction on the principles and practices of conveying solid materials using hydraulic and pneumatic systems. By the end of the program, participants will be equipped with the knowledge and skills necessary to optimize solid material transport processes in various industrial settings.

Program Objectives:

At the end of this program, participants will be able to:

- Learn how to be familiar with different systems for hydraulic transport and pneumatic conveying and their advantages and disadvantages.
- Understand the methods of the hydraulic and mechanical design of systems for the transport of solids according to existing world standards and codes.
- Learn how to make optimal selection and sizing of elements of a system for a given industrial application.
- Use the methods of estimating the efficiency of transport systems and the ways to improve the reliability of operation.
- Know the guidelines for accepted maintenance and protection techniques regarding problems in operation, such as corrosion, erosion, abrasion, wear.

Targeted Audience:

- Maintenance Engineers.
- Process and Mechanical Technicians.
- Design Engineers.
- Supervisors and Operators.
- Mechanical Engineers.

Program Outlines:

Unit 1:

Main Characteristics of Systems for Transport of Solids:

- System for hydraulic transport of solids: main features, elements, and components.

- Basics of the flow of liquids in pipes: velocity and pressure drop of the flow of mixtures.
- Classification of flow characteristics of common slurries.
- Review of main elements of slurry preparation equipment.
- Other vital components of the hydraulic transport.

Unit 2:

Pipeline Design Considerations:

- Selection of pipes, material, and diameter based on maximum fluid velocity.
- Detailed calculation of pressure losses in the pipeline.
- Selection and sizing of pumps for the hydraulic transport system.
- Handling of difficult slurries.
- After-treatment of transported material.

Unit 3:

Practical Aspects of System Safe Operation:

- System design environmental considerations.
- Guidelines for adequate pipeline installation and maintenance.
- Hydraulic system inspection, control, and performance testing.
- Problems with system starting and stopping.
- Methods of pipeline vibration reduction.
- Economic analysis: capital costs and operating costs.

Unit 4:

Characteristics of Different Types of Pneumatic Conveying Systems:

- Systems for pneumatic conveying of solids.
- Basics of the flow of gases in pipes.
- Sizing of blowers and piping connections.
- Review of main elements of material preparation equipment.

- Selection of pipe material and diameter and design of piping systems.

Unit 5:

Survey of Equipment and Methods for After Treatment of Transported Material:

- Material - gas separation.
- After-installation inspection and check-up.
- Receiving and unloading of material, start-up of operation.
- Operational problems and troubleshooting.
- Control and monitoring the system.
- Optimizing and upgrading the existing systems: issue of changing the material.