€TRAINING

Fluid Flow Control in the Process Industry

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Introduction:

This training program offers specialized instruction on managing and optimizing fluid flow systems within industrial processes. Through t, participants will gain the knowledge and skills necessary to design, implement, and troubleshoot fluid flow control systems effectively, contributing to improved overall performance and productivity in industrial settings.

Program Objectives:

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

- Recognize the physical characteristics of fluids that are to be measured by one of the flow measuring techniques.
- Gain insights into the measuring techniques and their capabilities and limitations.
- Explore the principles of existing world standards and codes related to fluid flow measurement.
- Select the right measurement techniques: an estimate of the accuracy and uncertainty of results.
- Recommend guidelines for diagnosing the problems in the operation of the entire system based on flow monitoring.

Targeted Audience:

- Engineers and technicians in oil & gas, chemical and process industries.
- Process, mechanical and chemical engineers.
- Engineers and technicians who deal with reactors and piping systems.
- Design engineers, project engineers.
- Control, automation, and instrumentation engineers.

Program Outlines:

Unit 1:

Fluid Flow Control in the Process Industry:

- Understand the importance of fluid flow control in the process industry.

- Classify fluid flow measurement techniques and understand their applications.
- Identify types of fluid flow measurements and their relevant standards.
- Examine the physical properties of liquids, gases, and multiphase fluids.
- Understand gas laws and how liquids expand under pressure.

Unit 2:

Basic Principles of Fluid Flow in Pipes and Other Geometries:

- Explore the relationship between pressure and velocity in fluid flow.
- Analyze the complexities of two-phase fluid flow.
- Understand the specifics of measuring velocity and pressure.
- Learn about flowmeters based on differential pressure.
- Differentiate between volumetric and mass flowmeters, probes, and tracers.

Unit 3:

Other Issues Related to Measurements:

- The role of probes and tracers in fluid flow measurement.
- Understand the use of readouts and related devices.
- Learn about proving systems and their importance in ensuring measurement accuracy.
- Apply fluid balance study techniques in measurement analysis.
- Understand the process of auditing and its role in ensuring measurement accuracy.

Unit 4:

Installation of Instruments:

- Learn how the installation of instruments affects the accuracy of results.
- Understand accuracy requirements and related issues.
- Explore the concept of uncertainty and statistics in measurements.
- Master the calibration of measuring instruments.
- Learn about the maintenance of meter equipment and the latest developments in the field.

Unit 5:

Flow Control of Pumps, Compressors, and Fans:

- Understand the application of control valves in flow regulation.
- Learn about the flow control systems in pump stations.
- Explore flow control systems in compressor stations.
- Understand the principles of flow control in pipelines.
- Pipeline monitoring systems and their role in flow control.