€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 this program 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.
- Learn about the measuring techniques and their capabilities and limitations.
- Understand of 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:

- Importance of fluid flow control in the process industry.

- Classification of fluid flow measurement techniques.
- Types of fluid flow measurements.
- World standards related to fluid flow measurement.
- Physical properties of liquids, gases, and multiphase fluids.
- Gas laws and expansion of liquids.

Unit 2:

Basic Principles of Fluid Flow in Pipes and Other Geometries:

- Relationship between pressure and velocity.
- Complexities of the flow of two-phase fluids.
- Specifics related to measurements of velocity, pressure.
- Flow-meters based on differential pressure.
- Volumetric flowmeters.
- Mass flow-meters, probes, and tracers.

Unit 3:

Other Issues Related to Measurements:

- Probes and tracers.
- Readouts and related devices.
- Proving systems.
- Fluid balance study.
- Auditing.

Unit 4:

Installation of Instruments:

- Effect of instrument installation on the accuracy of results.
- Accuracy requirements and related issues.
- Uncertainty and statistics.

- Calibration of measuring instruments.
- Maintenance of meter equipment.
- Recent developments and likely future trends.

Unit 5:

Flow Control of Pumps, Compressors, and Fans:

- Control valve application.
- The flow control system in pumps stations.
- The flow control system in compressor stations.
- Flow control in pipelines.
- Pipeline monitoring systems.