

# € TRAINING

Flow Measurement and Custody Transfer



30 June - 4 July 2024  
Cairo (Egypt)



# Flow Measurement and Custody Transfer

REF: E1376 DATE: 30 June - 4 July 2024 Venue: Cairo (Egypt) - Fee: 4465 Euro

## Introduction:

This training program offers comprehensive instruction on the operation, technology, and maintenance of gas turbines. Through theoretical learning attendees develop the skills needed to troubleshoot issues, optimize performance, and ensure reliable operation of gas turbine systems.

## Program Objectives:

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

- Develop a solid understanding of relevant fluid and gas laws essential for utilizing flow measurement devices effectively.
- Grasp the primary requirements of custody transfer systems within the industry.
- Appreciate the critical aspects of flow measurements, including accuracy and repeatability, for efficient operations.
- Acquire knowledge about contemporary flow measurement meters, encompassing differential pressure DP measurement, turbine meters, positive displacement meters, Coriolis flow measurement, magnetic flow meters, and ultrasonic flow measurement.
- Demonstrate the ability to evaluate the adequacy of a metering system, select appropriate custody transfer metering systems, and identify potential issues.
- Gain insights into the principles and applications of multiple meters/meter runs, flow computers, quality systems, calibration procedures, meter runs, proving, and supporting automation technologies.

## Targeted Audience:

- Engineers and Technicians of all disciplines.
- Instrumentation Personnel.
- Procurement and quality control personnel.
- Inspection and Maintenance engineers.

## Program Outlines:

### Unit 1:

#### Introduction - Basic Fluid and Gas Laws:

- Custody Transfer principles and requirements.
- Pressure, Viscosity, Flow Volume, Continuity Principle, Energy Law Bernoulli's.
- Flow Configurations Flow Profiles, Laminar Flow, Turbulent Flow.
- Reynold's Number, Flow Losses Friction Losses.
- Ideal and Real Gases, Gas Laws, Boyle's Law, Charles's Law, Gay-Lussac's Law.

## Unit 2:

### General Characteristics and Performance of Flow Meters:

- Competency Description: Understanding the fundamental concepts related to flow measurement including Accuracy, Precision, and Rangeability.
- System Characteristics and Flow range.
- Performance, Accuracy, Stability and Repeatability, Sensitivity, Noise, Linearity, Reliability.
- Flow modification and meter runs.
- Applications and Usage, Sizing.
- Temperature and Pressure Measurements.

## Unit 3:

### Types and Applications of Flow Meters:

- Differential Pressure DP Flow Meters, Orifice, Venturi, Nozzles, Pitot tubes.
- Positive Displacement PD Flow Meters, Rotor, Oscillating Piston, Oval Gear.
- Turbine Flow Meters, Conventional and Helical.
- Problems with Erosion, corrosion, Cavitation, and Obstructions.
- Uses and Applications, Installation requirements and Standards.

## Unit 4:

### Types and Applications of Flow Meters Continued:

- Ultrasonic Flow Meters.
- Magnetic Flow Meters.

- Coriolis Flow Meters.
- Uses and Applications, Installation requirements and Standards.
- Straight run requirement.

## Unit 5:

### Flow Measurement Systems and Custody Transfer Considerations:

- Custody Transfer Requirements.
- Meter Factor.
- Proving Systems; Direct, Indirect, Master Meter, Volume, Displacement.
- Custody Transfer Skids.
- Flow Computers and Communication.
- Temperature and Pressure Measurements.