

## Oil & Gas Processing Flow Measurement

*Dubai (UAE)*

*4 - 8 August 2024*

UK Traininig

# PARTNER



# Oil & Gas Processing Flow Measurement

Code: OG28 From: 4 - 8 August 2024 City: Dubai (UAE) Fees: 4400 Pound

## Introduction

Accurate flow measurement is essential to today's oil & gas operations. This course aims to provide training to facility operators, technicians, and engineers, which, once delivered, "keep on working". Participants are encouraged to raise queries both during and at any time after attending the seminar. Participants are also encouraged to bring with them any issues that they may have to the course.

## Course Objectives of Oil and Gas Processing Flow Measurement

- Understand the Legal and Commercial Metering Requirements
- Appreciate design criteria and the importance of accuracy
- Understand measurement concepts and types of error
- Understand the basic concepts, the principle of operation, and the equipment used for Gas metering, liquid metering, proving, and sampling
- Understand the basic concepts, the principle of operation, and the hardware used for typical flow computers, Prover Control Micro-computers, and Supervisory Systems.
- Understand the typical operations, control functions, and record-keeping requirements
- Evaluate the results of Turbine Meter Calibration and determine the validity by use of a Control Chart

## Course Outline of Oil and Gas Processing Flow Measurement

### Day 1

#### Typical Gas System Overview

- Typical Gas Pipeline System
- Role of Operator
- Overview of Typical Gas Sales
- Contracts

### Typical Gas Metering System Overview

- Introduction to Fiscal Metering
- Pipework and Valving
- Flow Measurement
- Secondary Instrumentation

### Primary Flow Measurement Instruction

- The Flowmeter
- Meter Tubes and Other Fittings
- Removals/Replacement Procedure

### Flow Measurement Accuracy

- Flow Measurement Uncertainty,
- Rangeability and Calibration
- Calculating Uncertainty
- Traceability

### Secondary Measurement Instrumentation

- Pressure Measurement
- Temperature Measurement



- Density Measurement

## Day 2

### Gas Quality Measurement

- The Gas Sampling and Conditioning System
- Relative Density Analyser
- Moisture Analyser

### Gas Chromatographs

- Introduction to Gas Chromatography
- Gas Conditioning System
- Gas Chromatograph
- Chromatograph Controller
- Calibration and Maintenance

### Computer System Overview

- Hardware
- Software
- Display Formats



- Alarm Handling and Interpretations
- Response to Input Failures

### Supervisory Computer System

- Hardware and Software
- Operator Interface
- System Security
- Communications

### Metering Panel Auxillary Equipment

- Analogue to Digital Conversion
- Power Supplies

### Day 3

### Introduction to Primary Flow Measurement Devices

- Introduction
- Basic Principles of Pipe Flow
- Mathematical Developments

### PRIMARY FLOW MEASUREMENT DEVICES - Differential Pressure Type



- Simple Theory
- Orifice Meters
- Venturi Meters
- Flow Nozzles
- Low Loss Devices
- Variable Orifice Meters
- Variable Area Meters
- Pitot Tubes and Pitot Static Tubes
- Target Flowmeters

#### PRIMARY FLOW MEASUREMENT DEVICES - Displacement Flowmeters

- Basic Principles
- Liquid Meters
- Designs for Gases
- Advantages and Disadvantages
- Applications

#### Day 4

#### PRIMARY FLOW MEASUREMENT DEVICES - Rotary Inferential Meters





- Turbine Flowmeters
- Miscellaneous Designs
- Advantages and Disadvantages

#### PRIMARY FLOW MEASUREMENT DEVICES - Fluid Oscillatory Flowmeters

- Principle of Operation
- Vortex Shedders
- Advantages and Disadvantages

#### PRIMARY FLOW MEASUREMENT DEVICES - Electromagnetic Flowmeters

- Principle of Operation
- AC and Pulsed DC Types
- Applications
- Advantages and Disadvantages

#### Day 5

#### PRIMARY FLOW MEASUREMENT DEVICES - Ultrasonic Flowmeters

- Doppler Type
- Time-of -Flight Type
- Clamp-on Type



- Applications
- Advantages and Disadvantages

#### PRIMARY FLOW MEASUREMENT DEVICES - Mass Flow Measurement

- Coriolis Flowmeters
- Angular Momentum Devices
- Thermal Meters
- Applications
- Advantages and Disadvantages

#### PRIMARY FLOW MEASUREMENT DEVICES - Miscellaneous

- Cross-Correlation
- Tracer Methods
- Weighing Methods
- Lasers





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International House 185 Tower Bridge  
Road London SE1 2UF United Kingdom



+44 7401 1773 35  
+44 7480 775526



[training@blackbird-training.com](mailto:training@blackbird-training.com)



[www.blackbird-training.com](http://www.blackbird-training.com)

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